TECHNOLOGY DEPT.

Gas Journal

VOL. 280. 106TH YEAR. LONDON, NOVEMBER 10, 1954 NO. 4771. PRICE 1/3

Full page, full colour advertising will bring you many enquiries for the new

DE LA RUE

Warwick

GAS COOKER

This entirely new cooker will attract many enquiries—encourage your staff to know all about it. De La Rue representatives will gladly help them with full technical information.

THE 'WARWICK' IS BEING ADVERTISED IN FULL PAGES IN COLOUR in

IDEAL HOME
HOUSEWIFE
GOOD HOUSEKEEPING
HOMES AND GARDENS

The Hulton Readership Survey 1954 shows that these four magazines, read mainly by women in the upper income brackets, have an aggregate monthly circulation of 750,000, and an estimated readership of 3,230,000. For a woman, to see the De La Rue 'Warwick' cooker is to covet it. To have the 'Warwick' on display in gas showrooms is to turn enquiries into additional sales.

DE LA RUE GAS COOKERS

THOMAS DE LA RUE & CO. LTD. (GAS DIVISION)

Imperial House, 84/86 Regent Street, London W.1.

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FIG. 150

modern H.P. design

Double-faced Modern H.P. Design. Corrosion Resisting Steel Door. Special Resilient Non-Metallic Composition Seats. Self-Lubricated. Seats enclosed and protected from Dust and Dirt in both Open and Closed Positions. Simple and Robust in Construction. Positive in operation. No Internal Operating Mechanism exposed to Gas Stream. No Wedges or Springs. Cannot Jam—Open or Closed. Spindle can be Repacked in the Open or Closed Position. Standard Test Pressure 100 lbs. per Sq. In. Air. Internal or External Screw with or without Indicator. Can be Adapted for Under-Pressure Connections. A High Pressure Valve at a Low Pressure Price. Sizes 3" to 24" Horizontal and Vertical.

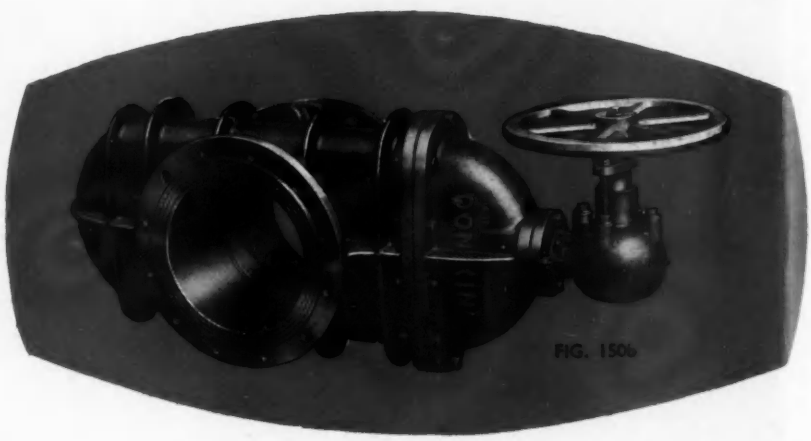


FIG. 150B

THE BRYAN DONKIN COMPANY LIMITED

CHESTERFIELD · (TEL : 3153) · LONDON

Makers of Gas Valves for over 100 Years

ncreasingly popular!

TRAY PURIFIER INSTALLATIONS

The hallmark of high quality plant

(Carr & Litler Patent No. 628338)

ALREADY OPERATING OR ON ORDER

1952——4 million cubic feet capacity

1953——26 million cubic feet capacity

1954——36½ million cubic feet capacity

This goes to prove that more and more GAS ENGINEERS are realising that they can obtain the advantages of SIMPLIFIED BOX-CHANGING on the CHEAPEST CAPITAL COST BASIS with TRAY PURIFIERS

(The up-to-date Purification System)

***TRAY PURIFIERS** can be emptied and re-charged in a fraction of the time needed when using standard boxes.*

***TRAY PURIFIERS** need fewer men to be regularly employed on purification, with no peak demand on the available labour force.*

***TRAY PURIFIERS** cost much less to empty and re-fill than ordinary boxes*

***TRAY PURIFIERS** eliminate most of Labour's objections to working in the earlier types of dry boxes.*

TRAY PURIFIERS MAY PROVIDE THE SOLUTION TO ONE OF YOUR PROBLEMS!

Further particulars on application to the Licensees:—

R. & J.
DEMPSTER
Ltd.

Constructional Gas & Chemical Engineers

GAS PLANT WORKS · NEWTON HEATH
MANCHESTER · 10

London Office: 34, VICTORIA STREET, S.W.1.

We make:—BY-PRODUCT and CHEMICAL PLANT · CONDENSERS · DETARRERS · GASHOLDERS · GAS VALVES and CONNECTIONS · IRON CASTINGS · PURIFIERS · STILLS · TANKS · WASHERS · WELDED and RIVETED STEEL WORK

A

For the office..

the flat..

or the one-roomer..

This attractive hotplate has two boiling burners controlled by separate taps. Constructed entirely of cast iron and finished throughout in easy-to-clean vitreous enamel, in either Cream and Brown or Grey Mottle and Black.

THE **Duette** HOT PLAT

FLAVELS of LEAMINGTON

Makers of fine quality cooking & heating appliances since 1777.

Telephone: Leamington 100 (Head Office) 3091/2 (Sales) Telegrams: FLAVELS.

RAWLBOLTS
are a Dry Fixing

With Rawlbolts there is no grouting, no waiting for cement to dry before the equipment can be used. This is an enormous time-saving factor in these days of man-power shortage. The solid sides of a small hole, into which a Rawlbolt fits snugly, afford all the resistance required for the expanding metal shields as the bolt is being tightened. When fully expanded, the metal shields exert a tremendous grip on the sides of the hole, ensuring an absolutely firm fixing. Rawlbolts are made in all sizes from $\frac{3}{16}$" to 1" bolt diameter, Whitworth thread. There are two types, Bolt-projecting and Loose-bolt (as illustrated), which is specially useful for heavy equipment because bolts can be inserted after the fixture has been placed in position.

RAWLBOLT
REFERENCE CHART FREE
Size 20" x 28½" this chart illustrates the 29 Loose Bolt and 21 Bolt Projecting Rawlbolts in their actual sizes. Different types of hole boring tools are also shown. Ask for a copy.

RAWLBOLTS GRIP *by* EXPANSION

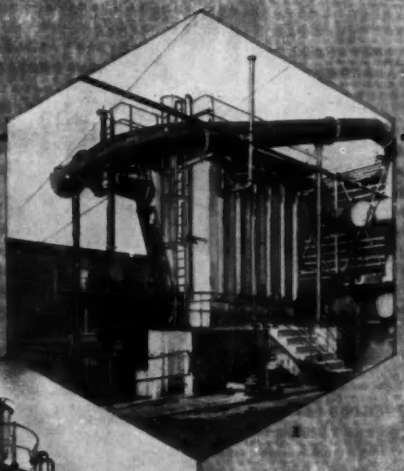
Rawlplugs, Rawltools, Rawlbolts, Rawltamps, Rawlnuts, Bolt Anchors, Screw Anchors, White Bronze Plugs, Rawltoggles, Rawlclips, Cement in Sockets, Durium Drills and Hole Boring Tools for Hand, Electric Hammer or Pneumatic Hammer operation.

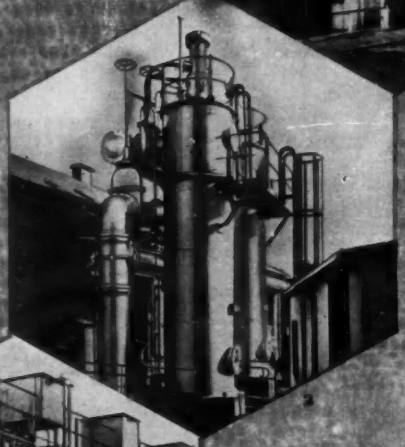
THE RAWLPLUG COMPANY LTD. RAWLPLUGS WALL PLUGS CROMWELL RD. LONDON, S.W.7

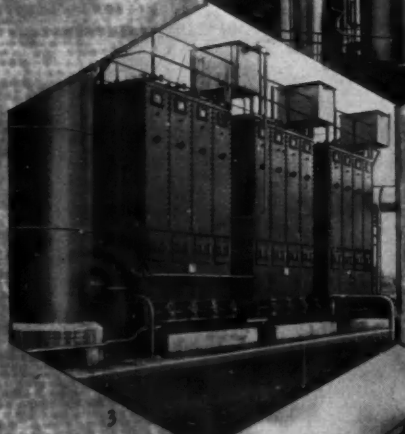
THE WORLD-WIDE FIXING DEVICES ORGANISATION

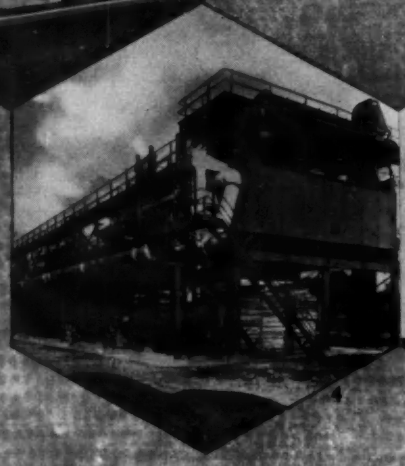
WHESSOE

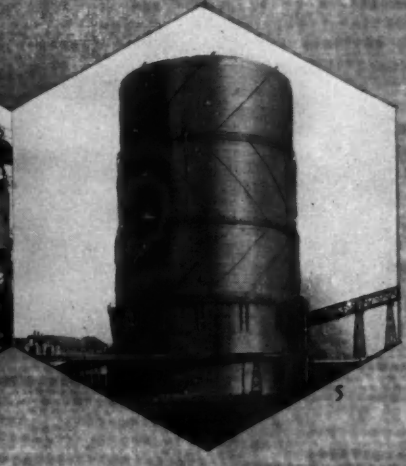
For GAS TREATMENT & STORAGE











Whessoe offer

- Unit and integrated plant for fuel gases
- Telescopic and high pressure gasholders
- Standard Pressure tanks for liquid petroleum gases
- Storage tanks for oil and liquid by-products
- Insulated spheres for storing liquid methane at atmospheric pressure.

The Whessoe technical service is ready to provide expert advice for individual applications.

Illustrated are (1) cross-flow condenser (2) W.W-D electrostatic precipitators (3) multi-stage scrubbers (4) oxide purifiers (5) spiral guided gasholder.

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An advertisement of Whessoe Ltd., Darlington, England. Telephone: Darlington 5315 • London Office: 25 Victoria Street, London, S.W.1. Telephone: Abbey 3881

W53

The HYDRALITE RANGE OF TANGYE JACKS lift so easily

"Lightest Jack in the World"

Everybody concerned with lifting or displacing heavy weights should know about the advantages of the 'Hydralite' super lightweight jacks. The 15 tons capacity weighs only 24 lb. Normally, jacks in this higher tonnage range take two or more men to move them. A 'Hydralite' is easily lifted by one man and shows a saving in manpower and operator fatigue.

PARTICULARS OF THE 'HYDRALITE' RANGE

Model	Capacity (tons)	Weight (lb.)	Power Lift (in.)	Closed Height (in.)
6515	15	24	6·5	11·375
625	25	32	6	11·5
650	50	61	6	13
1215	15	38	12	18·25
1225	25	53	12	18·875

SEND TODAY FOR 'HYDRALITE' LIST
or for help on your hydraulic problems

TANGYE

HYDRAULIC DIVISION

BUILT ON A CENTURY OF HYDRAULIC EXPERIENCE

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CLAYTON SON & CO., LTD., HUNSLET, LEEDS

SPIRAL GUIDED GASHOLDER & STEEL TANK. 125' x 30' CAPACITY 1,000,000.

GENERAL GAS APPLIANCES LIMITED

ARE PROUD TO ANNOUNCE THEIR NEW COOKER!

The Crusader

The Crusader—with 5 brand new features—campaigns to help women

- **Flat hotplate**—on which pans can be placed in any position without spilling or tipping.
- **Oven flue vented through front of splash-plate.** This prevents walls being heat marked, and warms plates in double shelf rack.
- **Burners enclosed in special tray** safe-guarding grill from splashes.
- **All hotplate parts lift off** for easy cleaning.
- **Recessed toe space** protects base from marking and scuffing.

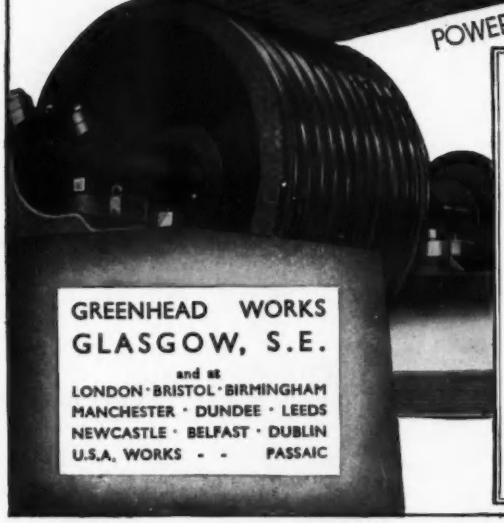
Your customers may choose this handsome cooker in any of these fine vitreous enamel finishes. All white, all cream, eau-de-nil and cream, white and grey. They'll admire the Crusader's push-in type safety taps on the facia panel, the fingertip thermostat oven control and the fully equipped oven, finished in light grey enamel.

THE CRUSADER SELLS ITSELF!

Made by
GENERAL GAS APPLIANCES LIMITED
AUDENSHAW, MANCHESTER
Proprietors: Allied Ironfounders Ltd.

R. & J. DICK LTD.

POWER TRANSMISSION SPECIALISTS



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Manufacturers of :-

"DICK'S ORIGINAL" BALATA Belts
For all general purpose drives

"DIXEL" VEE ROPES
Made endless or open for drives up to 3 000 H.P.

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Acid and Heat Resistant

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Solid Woven from "Filastic" yarn Vulcanised

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Combination Belt giving extra power

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RUBBER, MOULDED, ENDLESS

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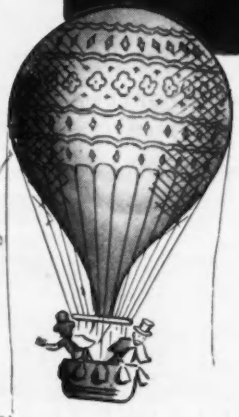

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Simple and robust construction, precise manufacture to carefully selected tolerances and strict concentricity throughout. The generated tooth-form gearing and essential working parts are totally enclosed in a grease-filled gearbox designed to ensure free operation. Care has been taken to prevent the possibility of corrosion and foreign matter affecting the mechanism over long periods under adverse working conditions.

George Wilson Gas Meters Ltd.,

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OXIDE HANDLING
THE MODERN WAY

OXIDE HANDLING TRANSPORTER
WITH COVER LIFTING EQUIPMENT

Special Features of this plant :

- **Elevator in Aluminium**
- **Gravity-weighted Cable Reeling Drum**
- **Abrasive Rubber Covered Belt Idlers**
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Telegrams : HUWOOD, GATESHEAD. *Telephone :* LOW FELL 76083 (5 lines).

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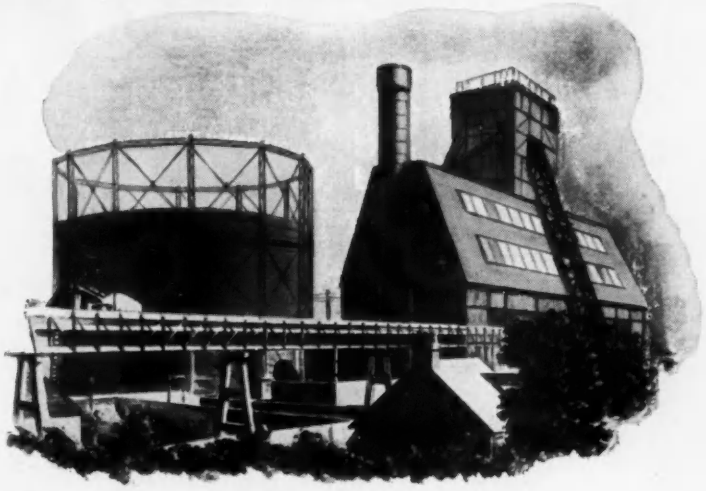
Telegrams : HUWOOD AVE, LONDON. *Telephone :* LONdon Wall 6631-2-3

Wheels of industry the world over are turned

by

B T-H

ELECTRIC MOTORS



in the gas works

Whenever a power drive is needed, there is a BTH motor that will do the job efficiently and economically. In industries all over the world, BTH motors are helping to increase production. Over half-a-century's experience of this branch of electrical engineering enables BTH to offer the motor with the mounting, enclosure, rating and performance best suited to the application.

BTH factories are exceptionally well equipped to make both ***STANDARD*** *and* ***SPECIAL*** *machines in large quantities*

THE
BRITISH THOMSON-HOUSTON
COMPANY LIMITED, RUGBY, ENGLAND

Member of the AEI group of companies

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invite your enquiries for

GAS PLANT

PURIFIERS
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TAR EXTRACTORS

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SCALE HASN'T A CHANCE!

says GENERAL DESCALING, M.C.E.* THE DEFENDER OF GAS MAINS

"We can rout scale out from the most strongly-held salient at a fraction of the time and cost it takes to lay new mains! A period of from 8 to 10 hours is all that my men usually require to descale a length of main, say 325 yards long and anything from 1½" to over 36" in diameter. We'll leave a finish as good as new, with no hammering of pipes or damaging of ferrules. Like to tell you more . . ."

**Mechanical and Chemical Engineer.*

ANTI-SCALE INVASION FORCES

led by General Descaling are ready and equipped to tackle scale *anywhere* at a moments notice. Write or phone details of *your* scale problem, which will receive our immediate attention.

GENERAL DESCALING IN FRANCE

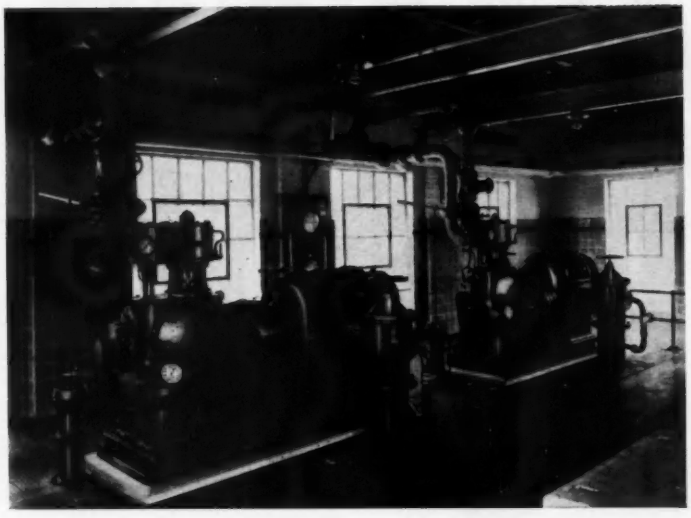
Time and place means nothing to General Descaling. Here, forces under his command are seen coupling the flexible rods onto the boring machine preparatory to boring a gas main in Lyons.

GENERAL DESCALING CO. LTD.,
H.Q. WORKSOP, NOTTS.
Telephone 3211-3

SISSON STEAM ENGINES

FOR LONG PERIOD CONTINUOUS RUNNING

DESIGNED for driving EXHAUSTERS BOOSTERS COMPRESSORS ETC.



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SUITABLE for GAS GOVERNOR or AUTOMATIC CONTROL

Telegrams: SISSON

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INSULATING BRICKS, RECUPERATOR TUBES, SPECIAL SEMI-SILICA QUALITY FOR SEGMENTAL RETORTS WITH NO EXPANSION OR CONTRACTION AT 1400° C

Manufacturers of
Fire Bricks, Lumps & Tiles
OF EVERY DESCRIPTION

"A truly wonderful machine..."

READ THIS LETTER

"We had no compressor or portable breaker on the site"

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Branch - Engine Yard, Belvoir, Grantham.

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AGRICULTURAL ENGINEER
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All Kinds of Joinery Work Taken

Agent for Erectors of Steel Agricultural Buildings

20th. August, 19

Our Ref. WJR/KAM.
Your Ref

Messrs. Whitlock Bros Ltd.,
Great Yeldham,
Essex.

Dear Sirs,

I have now had in continuous use for more than six months the Dinkum Digger and thought you might be interested to see the enclosed photographs which were taken on a drainage excavation job I recently carried out for the Caythorpe Farm Institute in Lincolnshire.

The photographs themselves will explain how satisfied I am with the machine and I can assure you we have had no Compressor or Portable Breaker on the site.

This could be confirmed by the manager of the Institute Mr. Rolland.

During these six months I have used the Dinkum Digger on practically every type of excavation work but this I think is about the toughest job I have yet tackled and the machine worked perfectly.

Fuel consumption is only half a gallon per hour.

With best wishes for the future success of a truly wonderful machine.

Yours faithfully,

W. J. Roberts.

The toughest job I have yet tackled...machine worked perfectly

"Fuel consumption only ½ gall per hour"

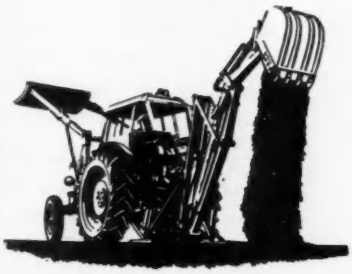
THE WHITLOCK

Dinkum Digger

Pat. Nos. 686946, 11681/53, 34122/3/4/5/6.

As supplied to leading Water, Gas and Coal Boards.

THIS WONDERFUL MACHINE can earn you **BIG** profits and ease your labour problems. It will cut trenches 10in. to 36in. wide and down to 9ft. deep. With fore-end attachments which are available it will **BULLDOZE, BACKFILL, LOAD, LIFT, SHOVEL,** and, in fact, carry out practically every earth-moving operation on a building site. It can be ready for transport in under one minute and driven off under its own power to a new site at 15 mph. Hundreds of **DINKUM DIGGERS** are in use with outstanding success. Enquire about this profit-earning machine which can be bought on H.P. terms so favourable that not only will profits cover the monthly instalments but show a big dividend as well. *Demonstrations can be arranged on your site.*



See it at PUBLIC WORKS and MUNICIPAL SERVICES CONGRESS and EXHIBITION Olympia - November 15-20 on the following stands
WITLOR LTD - Stand 127. ERNEST DOE & SONS LTD - Stand 171

WHITLOCK BROS LTD GREAT YELDHAM ESSEX · Tel. 305 (6 lines)

"Yes, I've checked these graduations most carefully....

"....I've never yet found the slightest inaccuracy in a 'PYREX' Glass graduated Burette, or in fact in any 'PYREX' graduated vessel."

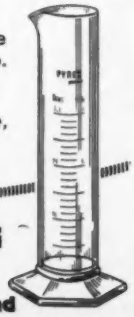
"Our work is rather special, so we always use Works Class A standard, but I am sure we'd be quite safe in using Works Class B at the lower cost. Of course we keep NPL Class A for all our research work."

"What about breakages?"

"Very few, Sir! You see, 'PYREX' can be made so much more sturdy and robust because of its low coefficient of expansion (actually 3.2×10^{-6})—and we never have breakage through heat, nor any sign of chemical attack."

● 'PYREX' Brand Graduated Glassware is made only by James A. Jobling & Co. Ltd., Sunderland.

● *Large new catalogue FREE. Send name, address, and position in firm.*



MADE IN ENGLAND PYREX

JAMES A. JOBLING & CO., LTD.

Wear Glass Works, Sunderland

The only makers of 'PYREX' Brand Glass in the United Kingdom.

SAFE LIGHTING UP WITH FSM

The new principle of the Elcontrol FSM Flame Failure Equipment is the detection of fluctuating infra-red radiation which is characteristic of every flame.

a FSM Equipment is equally effective on any gas.

b It gives positive discrimination between flame and glowing refractory.

c It does away with difficulties connected with correct siting, excess dust in flame, or probe leakage often encountered with flame conductivity systems.

d Permissible cable run from viewing head to unit up to 100 ft.

e Fully automatic ignition and flame failure control panels are now available, as well as basic on-off control units from under £30.

Send for FSM Data Sheets:

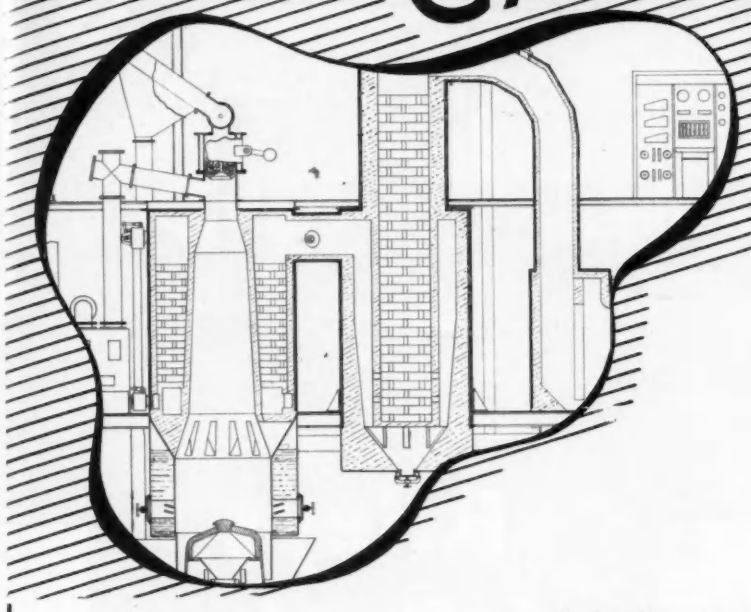
TRADE E MARK

ELCONTROL LTD

10 Wyndham Place, London, W.C.1

Ambassador 2671

COMPLETE GASIFICATION

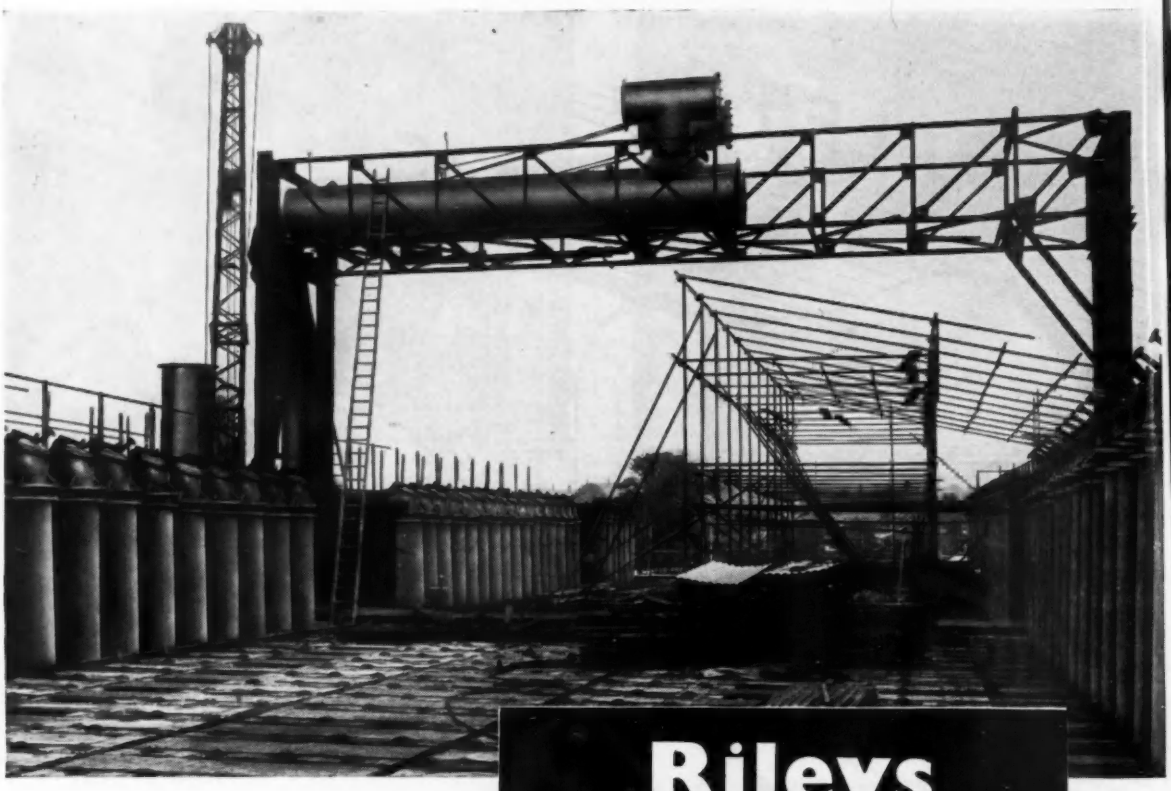


Tully Complete Gasification Plants combine the latest development in gas engineering with many years of sound practical experience. Units from 0.5 to 5.0 million cu. ft. per day capacity are available with complete automatic operation, including automatic fuel handling, charging and clinkering. Units above 2.5 million cu. ft. per day can be provided with dry-sealed automatic grates.

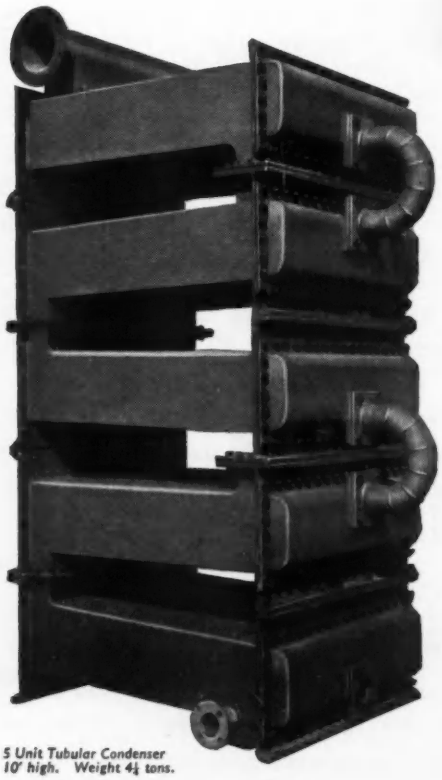
The TEC organisation also specialises in the construction of:—
Producers for Dilution and Direct Heating;
BWG Plants for Dilution and CVR re-cycling;
Carburetted Water Gas Plants for Peak load;
Oil Gasification for Industrial Heating and Peak Load.

TULLY

TULLY ENGINEERING COMPANY LIMITED
NEWARK NOTTINGHAMSHIRE



Rileys of Batley



5 Unit Tubular Condenser
10' high. Weight 4¼ tons.

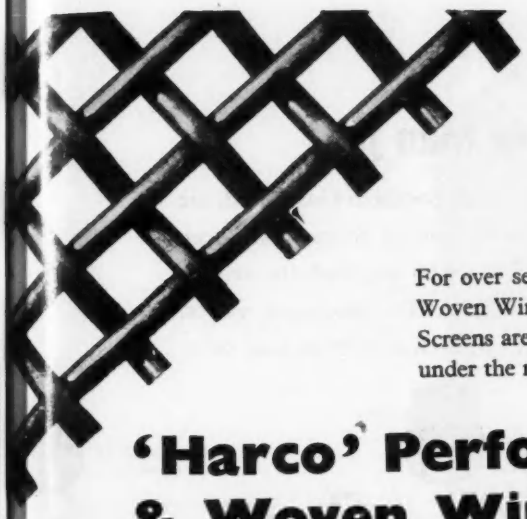
Engineers to the Gas and Allied Industries

Also specialists in the production of welded fabrications, riveted work, etc.

The above illustration (shown by permission of the Woodall Duckham Construction Co. Ltd). shows the erection of the offtake and suction mains over the battery and the pullman valves and ascension pipes to the collecting mains. In the background scaffolding has been erected for a temporary roof over the battery. We invite your enquiries whether they be for construction work, extensions, or entirely new installations. We have 65 years of specialised experience.

A. J. RILEY & SON LIMITED
VICTORIA WORKS, BATLEY, YORKSHIRE
Telephone: Batley 657 (3 lines). Telegrams: Boilers, Batley.

IN ASSOCIATION WITH JAMES AUSTIN & SONS (DEWSBURY) LTD.



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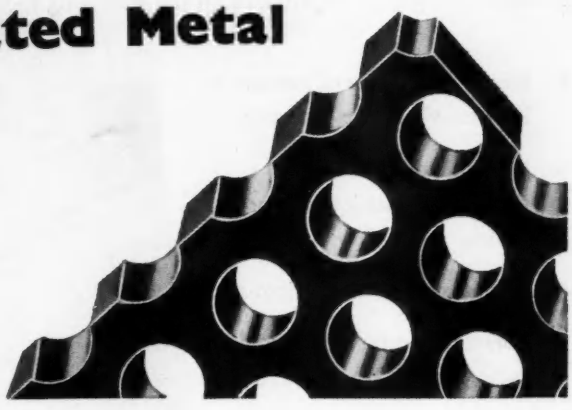
For over seventy years, Harveys have been making Perforated Metal and Woven Wire for every conceivable purpose, in every kind of metal. 'Harco' Screens are designed to give maximum output over prolonged periods and under the most exacting conditions.

'Harco' Perforated Metal & Woven Wire

Send for Catalogues No. GJ 269 and 782.



Harvey

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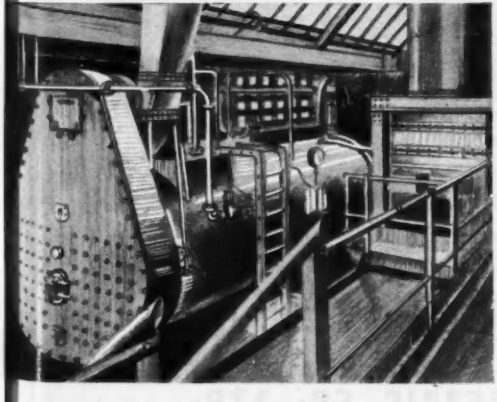

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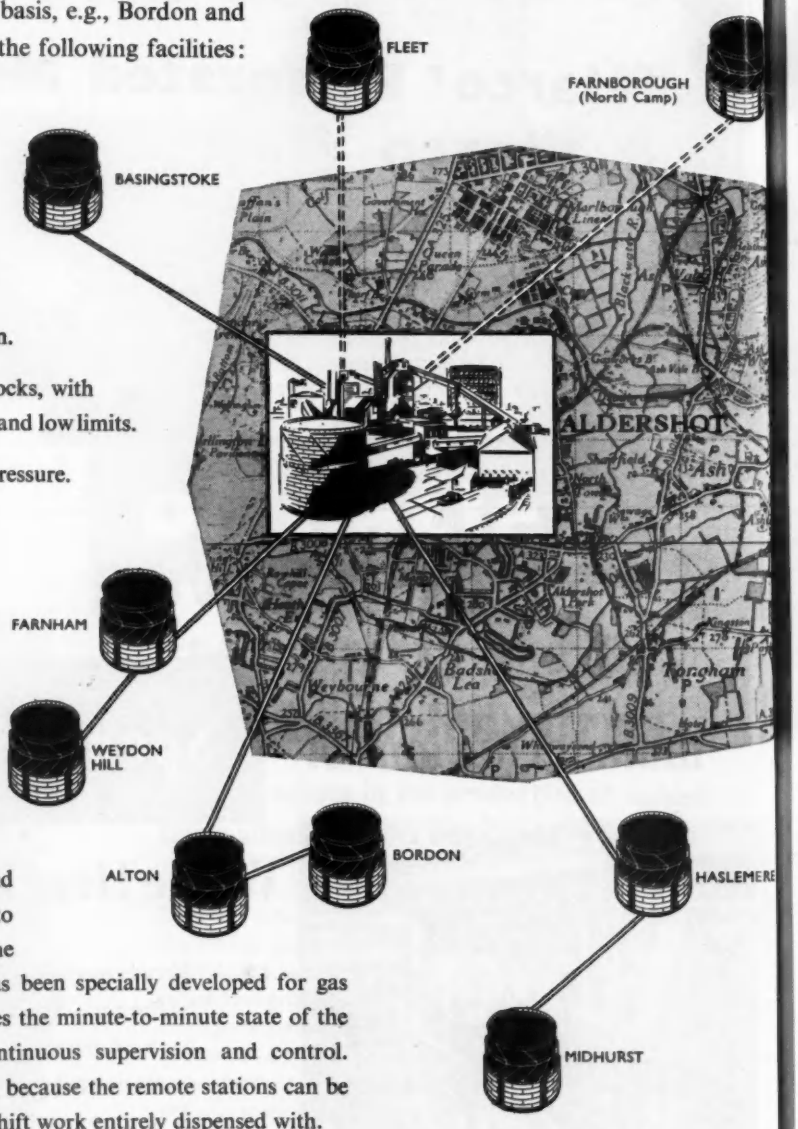

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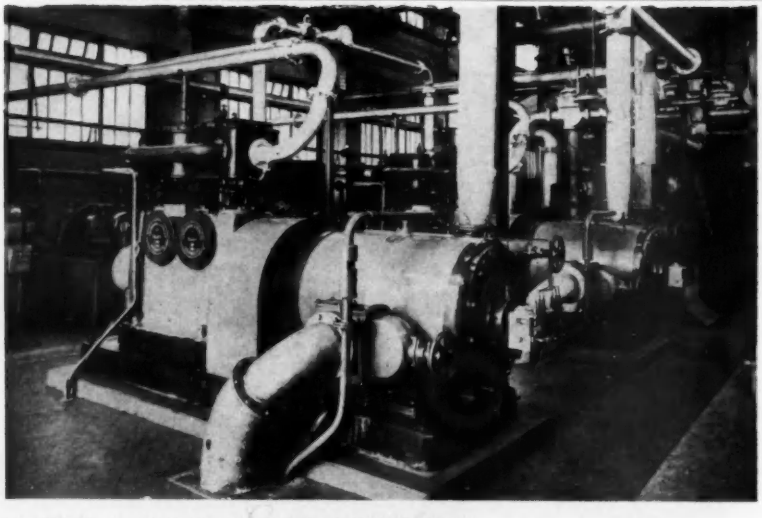

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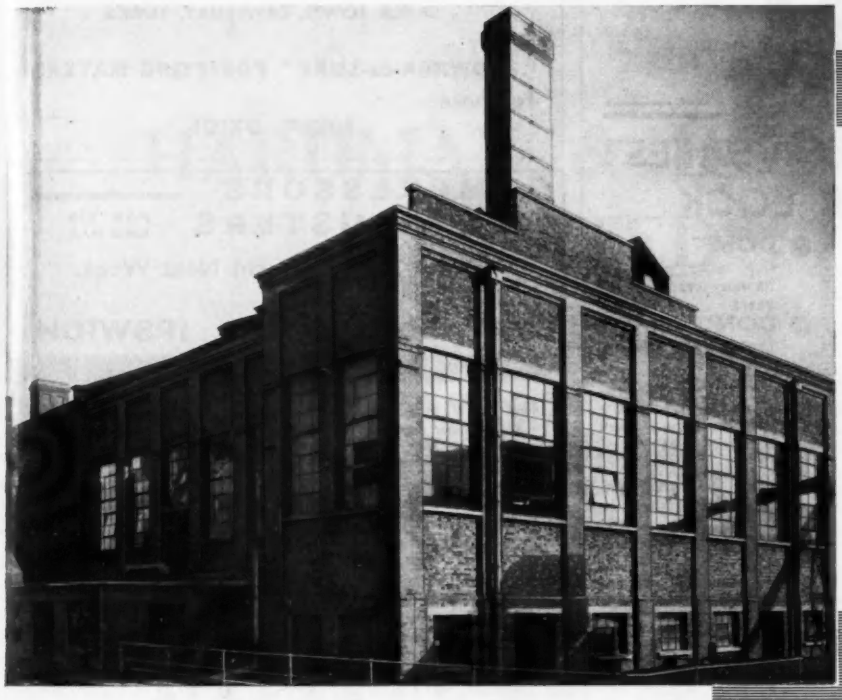

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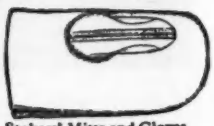
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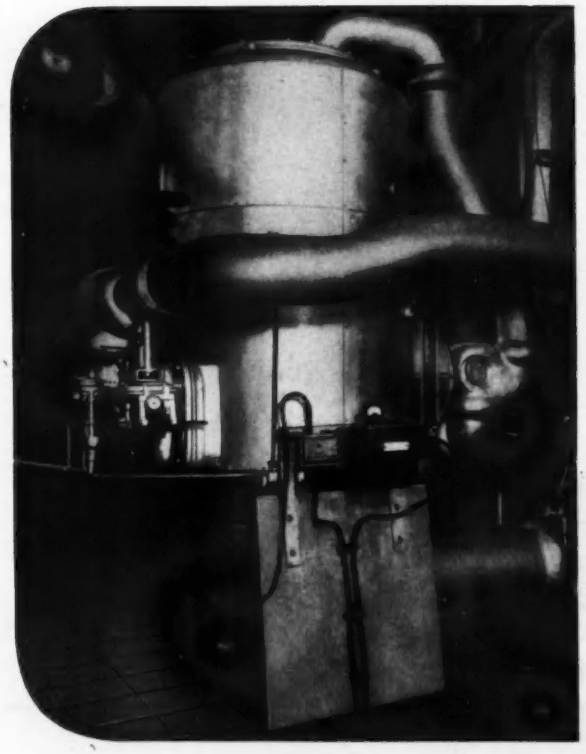

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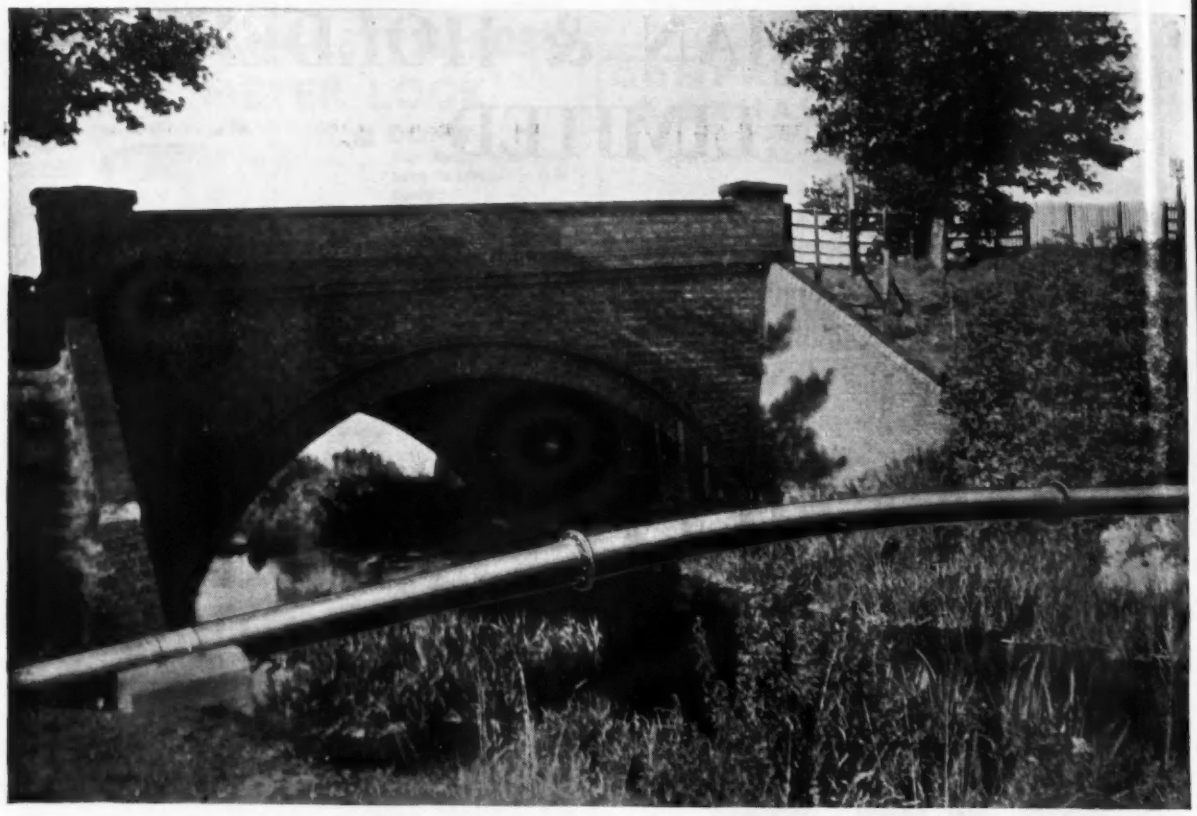

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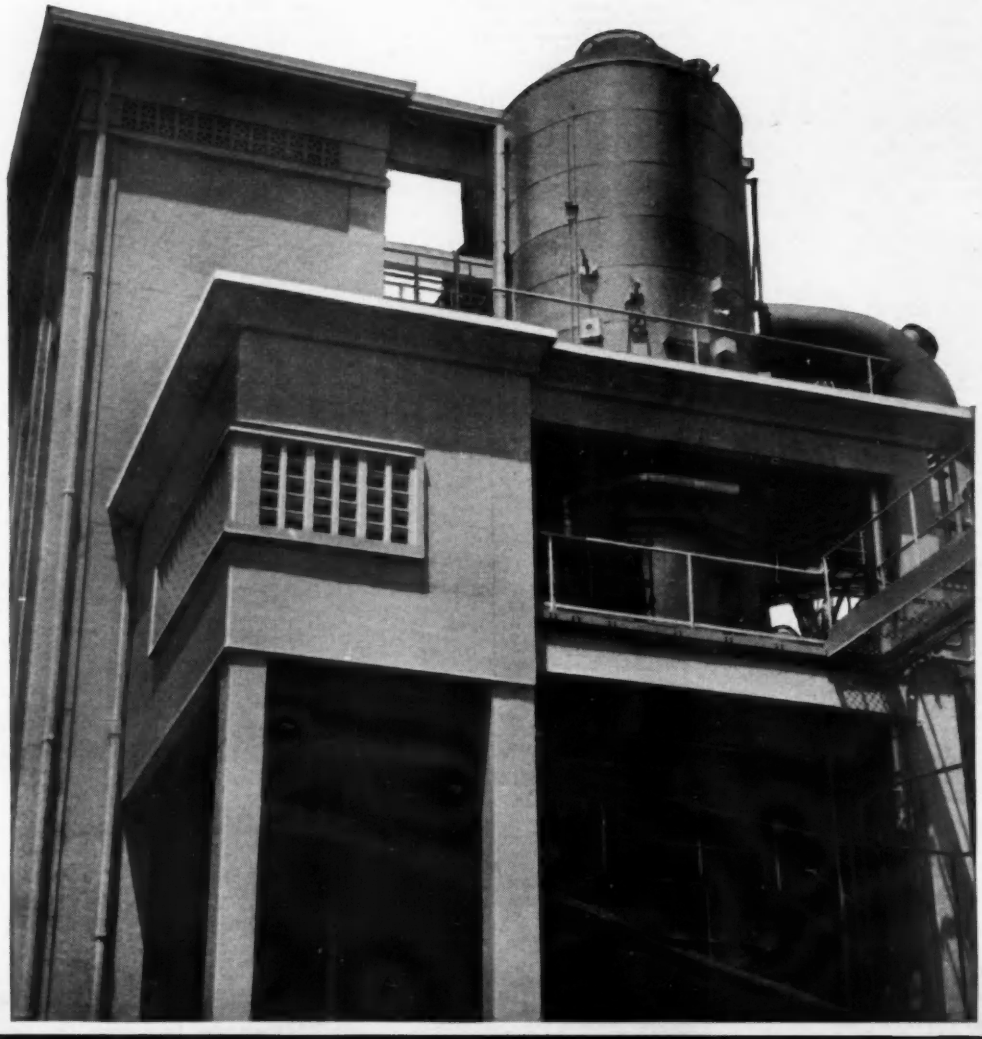

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VOL. 280 NO. 4771 November 10, 1954

106th YEAR

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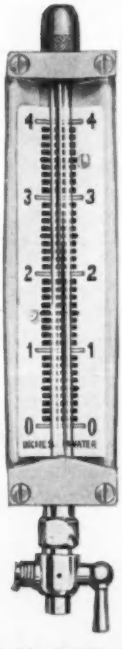

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The Gas Council's Reply

TWO weeks ago, in our first leader, reference was made to an article which had been published in the October 2 issue of the British Medical Journal. This article came from the pen of Dr. Keith Simpson, Reader in Forensic Medicine at Guys Hospital, University of London, and was entitled 'The Danger of Accidental Carbon Monoxide Poisoning.' In it, Dr. Simpson reviewed the symptons of carbon monoxide poisoning and examined the causes of such poisoning, particularly by coal gas or its products of combustion. As was mentioned at the time, Dr. Simpson delivered some hard knocks at the gas industry in this matter of accidental gas poisoning and took it upon himself to castigate the industry for, 'the apparent unconcern with which the gas authorities take this alarming toll of life.' These were 'fighting words,' such as called for a swift and unequivocal answer. It may be recalled that at the end of the leading article in question we thought it likely that we should have to return to the subject of Dr. Simpson's remarks before many weeks had passed—nor were we mistaken!

The Gas Council has immediately taken up this unmistakeable challenge to the integrity of the industry and in a forthright letter to the Editor of the British Medical Journal, published on October 30, Mr. F. G. Brewer, Secretary to the Gas Council, has answered Dr. Simpson clearly and concisely. On page 387 of this week's GAS JOURNAL, Mr. Brewer's reply is reproduced in full because the gravity of the original charge and the necessity for the gas industry to vindicate itself will have been deeply impressed on the minds of all who have the interests of gas at heart. It is not proposed here to go into the details of the original article again nor to analyse Mr. Brewer's letter sentence by sentence —the letter speaks quite adequately for itself—but rather to comment briefly on one or two thoughts which this exchange has evoked.

All in the gas industry know quite well that town's gas and its products of combustion can be dangerous to health and indeed to life in certain *abnormal* circumstances. The emphasis on *abnormal* is deliberate since it is equally true to say that in *normal* circumstances gas is quite innocuous in use. Only when it is improperly used does it become a potential danger. In this respect gas is much the same as any other commodity, for there are few things of which we can think that do not become dangerous to life and limb if they are abused. Mr. Brewer points out in his letter that 'the Report of the Home Office Standing Inter-departmental Committee on Accidents in the Home' places the commonest kinds of accident in the following order of importance: falls 58%, burns and scalds 13%, suffocation 12% and last, coal gas poisoning 8%.' From these figures it can be seen that gas is not by any means the most frequent cause of fatal accidents in the home.

However, before we dismiss Dr. Simpson's strictures from our minds, it should be admitted that it is useful that we are reminded, from time to time, of the possible dangers inherent in the use of our chief product. It is made clear in the Gas Council's letter, in this case especially for the benefit of the medical profession, that the gas industry is doing everything in its power to ensure that all gas appliances are as safe and foolproof as possible in operation, that the importance of maintenance is fully realised by the consumer and that gas leaks are reported as soon as detected. A great deal of publicity is devoted to the attainment of these ends; instruction cards, meter cards, gas bills and public notices, all combine in the effort to inform consumers about the correct use of gas appliances and of the services which are available to them through their gas boards. It may well be asked, then, is there anything further that can be done to help reduce the number of those accidents which do still occur in the use of gas, particularly amongst older people? Here we would suggest, is an opportunity for each one of us in the industry—and there are some 145,000 of us—to help. Wherever we go we see gas appliances in use—cookers, fires, water heaters, wash boilers and so on—and in some cases we may notice that they are not safely connected to the supply, not correctly adjusted or perhaps giving evidence that a flue requires cleaning. Being 'in gas' ourselves we may take it for granted that others are as familiar with its proper use as we are and we may assume that they are fully aware of the possible danger of what they are doing. Often this is not the case and a friendly word of advice on such an occasion can help avert an accident, possibly a fatal one. If every member of the industry makes it his business to watch out for possible sources of danger, and if he then does his best to eliminate the hazards a most valuable contribution will have been made towards the maximum of safety in the use of gas.

East Midlands Experiment

THE organisation of a live, integrated, and enthusiastic sales force is a task which has been successfully accomplished by many large concerns. Oddly enough, although the gas industry is a comparatively old industry, this moulding of an effective sales machine is a new experience for it. This is not to say that there has been no organised selling in the past, but it has not been on anything like the scale it is now. The planning of a complete sales force for an area board with the combination of drive, inspiration, and organisation from above, and of enthusiasm, loyalty and training from below, is being tackled with varying success by all twelve boards. The main obstacle would seem to be an inability to think big, to stop being parochial, to watch the horizon rather than one's own feet.

No area gas board has shown a greater determination to master this problem than the East Midlands, and the results of that effort are now becoming apparent. The seeds were sown three or four years ago and now the harvest is coming in. What then characterises sales progress in the East Midlands and to what does it owe its unquestionable success? We can only base our answer on our own observations, but we do not think we would be very wrong if we plumped for these three basic factors: the sales department of the Board is successful because it is not only willing to learn but it goes out of its way to be taught; it is successful because it believes in young blood and is prepared to take a chance on youthful talent and determination to make good; and it is successful because every part of the sales organisation is injected with a very real team spirit. And we might add that no good team has ever been built up without a good captain.

Suppose we consider these factors one by one. Willingness to learn—how is that apparent? We suggest that it is to be seen in the experimenting with, and in some cases the adoption of, ideas from the United States and the Continent, and in the marked policy of inviting leading representatives of commercially successful business firms to explain their methods and convey their enthusiasm to sales staff in the Board's area. Young blood—that is an easy one. Merely look at the headquarters sales and publicity personnel. And as for team spirit, well, surely no visitor to any of the Board's sales gatherings can remain unimpressed by the spirit which infuses its members—or should we say that it is infused into them?

These gatherings follow the same pattern as in most other boards. There are divisional Salesmen's Circles, all of which are segments of one Area Sales Circle. The Area Circle has an annual meeting which is usually so full of surprises that really no one is particularly surprised any more. They just know that there will be surprises and maintain a sort of confident expectancy.

The area meeting this year was no exception. Delegates who might originally have expected to hear addresses on gas have instead been favoured with dissertations on Whitbreads, Marks and Spencers, and similar concerns. Thus few members could have been very surprised to find that of the three main features at last Thursday's conference, one dealt with Batchelors' Peas and another with Lamson Paragon selection and training methods. Sometimes this bringing in of sales people who have no knowledge of gas—which they admit with almost alarming heartiness—serves to reveal just how close is the link of method and fundamental technique between selling gas appliances and, say, baked beans. Sometimes it does not. But whether the method is similar or not, there is, we believe, another advantage in importing salesmen from other industries. It is this—they are all sales executives of the finest calibre and they radiate a strength of personality and confidence which is impressive and comes right across the footlights. It is a quality to which we in the gas industry are unaccustomed, and in our view it cannot fail to inspire those who hear them. In their profession these are big men, usually self-made men, but they are not stuffy, pompous, or conceited. We suspect that this is because the fundamentals of their job depend upon human relations, and of course, you cannot excel in human relationships unless you happen to be human in the first place. There is a moral here as big as your fist—need we point it out?

To return to the East Midlands sales conference. The Lamson Paragon Company favoured us with a demonstration on 'Selecting, Training, and Stimulating the Sales Force,' the like of which we had never seen before. This was a far cry from the average mocked-up playlet. Several of the team, which included senior sales executives of the company, had had dramatic experience and they put over an act—there is no other word for it—which had pace, imagination, and the hallmark of intensive rehearsal. Apparently this was only a very small slice of a very large repertoire of demonstrations which the company regularly puts on as part of its training programme. It makes you think.

Among this high speed variety it is pleasant to be able to report that foreign talent in no way eclipsed our own industry. The Gas Board was represented by Miss E. P. Corkill, Home Service Adviser at Northampton, whose paper 'Home Service with a Difference' is, we suggest, of a class far above that which we have come to expect from the industry's 'charm school.' Mr. Sydney Smith, the Chairman of the Board, explained that her paper had been selected because of 'her appraisal of the trading situation of the Board, and the general quality of her observations.' He was so right, but listening to Miss Corkill it was at times a little difficult to realise that one so charming could talk so much sense. Unfortunately this paper, which is reproduced in the November issue of 'GAS SERVICE,' is likely to be Miss Corkill's last gift to the gas industry, which she proposes to leave in the near future.

By now the astute reader may have gained the impression that we have a high regard for East Midlands sales policy and for the organisation of its sales meetings. We have indeed, and if in these comments we have concentrated on those elements which we admire and have refrained from mentioning one or two about which we are less certain, it is because, by and large, this Board knows what it wants, and if it is not sure how to get it, it is prepared to keep on trying until the right formula is found. All experiments cannot be successful, but without experiment there can be no progress at all.

Personal Notes

MR. A. JORDAN, Technical Assistant, Electrical Engineer's Department, South Eastern Gas Board, has been appointed Electrical Engineer, Sheffield and Rotherham Division, East Midlands Gas Board.

MR. WILLIAM T. GILCHRIST has, in addition to his duties as District Manager of the Scottish Gas Board at Cowdenbeath, Fife, been appointed District Manager of the Kelty and Lochgelly districts of the Board. MR. P. GOURLAY, Markinch, has been appointed Supervisor at Kelty, and MR. J. CHRISTY, previously assistant, has been appointed Supervisor at Lochgelly.

MR. H. J. ESCREET, who retired recently from the post of Distributing Engineer with the North Thames Gas Board, was presented recently with a pair of binoculars subscribed for by his colleagues. The presentation was made by Mr. A. D. L. Copp, who succeeds Mr. Escreet as Distributing Engineer. Mr. Escreet had a distinguished career of over 41 years with North Thames, and by reason of his long experience in gas distribution became one of the foremost authorities on the subject. His most significant work was the development of the Board's trunk main system. Maintenance of gas supply during the war, when plant and mains were repeatedly damaged by enemy action, owed much

Mr. A. D. L. Copp (right) making the presentation. Mr. Escreet says he will use the binoculars to take up bird-watching from the comfort of his large garden at Chislehurst (Kent).

to his flair for making accurate and speedy decisions in sudden and seemingly overwhelming emergencies. It was as a clerk in the rental department that Mr. Escreet began his service with the old Gas Light and Coke Company in 1912. Shortly afterwards he was awarded an engineering staff pupilship. Then came the first world war, during which he served in France and Belgium with the Royal Field Artillery. The pattern for his future was set by his transfer to the Distribution Department in 1920. Three years later he was appointed Assistant Distributing Engineer. He became Deputy Distributing Engineer in 1932 and Distributing Engineer the next year.

MR. J. G. RUTHERFORTH, Manager of the Prestonpans works, was presented on behalf of the employees with a cigarette lighter prior to his departure from Prestonpans to take up a new situation at Dalkeith under the Scottish Gas Board. Mr. Rutherforth, who had been at Prestonpans for the past seven years, was responsible for a record output of gas in one shift, amounting to 500,900 cu.ft. He has been appointed superintendent of the Dalkeith area.

MR. ARTHUR SHAW has been appointed as Publicity Manager of Sidney Flavel & Co., Ltd., and he will be responsible for the co-ordination of all advertising, including public and Press relations, for the Flavel Group of Companies. Mr. Shaw was educated at Manchester Grammar School, and Newport Grammar School, Isle of Wight, and served throughout the war in the Royal Air Force, being awarded the D.F.C. in 1942. Prior to joining the Company he was Advertising and Sales Promotion Manager for Dimplex Radiators, Ltd., Southampton.

MR. J. H. SPENCER, Regional Personnel Management Adviser, East and West Ridings of Yorkshire, Ministry of Labour and National Service, Leeds, has been appointed Deputy Industrial Relations Officer, Headquarters, East Midlands Gas Board.

Obituary

MR. GEORGE W. WORTLEY, General Manager of the Gothic Works of R. & A. Main, Ltd., since 1922, has died. A Yorkshireman, he studied in Sheffield and London and entered the gas industry just before the first world war. After serving with the Royal Navy he joined R. & A. Main in London and was transferred to the Gothic Works, Falkirk, in 1920. Two years later he was appointed General Manager, and in 1944 was appointed to the Board of the firm and its associated companies. Mr. Wortley was responsible for the introduction of the wet process vitreous enamelling of gas cookers—a notable achievement which was instrumental in bringing about a revolutionary change in domestic gas cooking appliances. He also took a keen interest in the improvement of cooking appliances, and especially studied the problems associated with the use of cast iron in their manufacture. His eldest son is General Manager of the Edmonton works of R. & A. Main, Ltd.

Correspondence

The following letter was published in the British Medical Journal *of October 30.*

AVOIDANCE OF ACCIDENTS WITH GAS

SIR, Dr. Keith Simpson's experience of the causes of accidental deaths is such that anything he writes commands attention. The gas industry regards as most valuable, and can confirm, the analyses which he gives in his article on 'The Danger of Accidental Carbon Monoxide Poisoning,' and it welcomes his reminder to consumers about the importance of seeing that their appliances and installations are properly maintained, for it devotes much of its publicity to that subject. It is to be regretted, however, that apparently he did not inform himself of what the gas industry has done and is doing in the interests of safety. Had he done so, he could not have said that 'the apparent unconcern with which the gas authorities take this alarming toll of life is astonishing.' The statement is as unfair as it is inaccurate.

For many years the industry has given earnest attention to safety, and its efforts have been intensified since the area boards took over control. Its view has been that safety begins with the design of appliances and sound installation. Before being placed on the industry's approved list all new types of appliances and fittings are tested in the industry's laboratories; and the Boards buy only appliances on this list. Safety is the first requirement in any test.

A special committee appointed last May is giving priority to the study of possible modifications in design and of devices still further to promote the safety of appliances. Particular account is being taken of the large proportion which accidents in the higher age groups bear to the total number.

The use of simple types of safety taps on supply pipes and appliances has been extended since the war. All taps on cookers now approved are of the safety type. During the last four years old cookers have been replaced by modern appliances at the rate of some 350,000 a year.

Day and night emergency services are maintained, and immediate attention is paid to any report of an escape. Notices appear on meter cards and gas bills and are posted in showrooms telling consumers what to do if they have the slightest suspicion of a leak of gas.

Dr. Simpson suggests that gas radiators, stoves, refrigerators and geysers should all have vents. If by geysers bath water heaters or multi-point heaters are meant, adequate flueing is standard practice; but flueing is not required for instantaneous sink water heaters or storage heaters or for the other appliances he mentions, any more than for a gas lighting burner. The boards would never fit a flue to an appliance giving bad combustion: the appliance would be put right; otherwise it would be removed.

With regard to the 'common meter,' no board would install or knowingly allow to remain installed, a prepayment meter to serve more than one occupancy. Pamphlets of the Royal Society for the Prevention of Accidents and of the Inter-departmental Fire Prevention Committee include advice that, before a coin is inserted after a supply has run out, care should be taken to see that all taps are turned off. Out of a total of some 12 mill. domestic consumers, nearly 8 mill. have prepayment meters. The number of deaths classified as 'prepayment meters giving a restarted supply' has averaged 10 a year for the past few years, or approximately 2 per cent. of the total number of fatalities; and this includes all prepayment meters, not only 'common meters,' a very small proportion of the whole.

Dr. Simpson refers to fractured mains outside premises. Fatalities due to escapes from mains and services were 20, 14, 24 and 5 in 1950, 1951, 1952, and 1953 respectively. He implies that the existing cast iron mains are out of date by comparison with 'drawn' pipes. Underground pipes are required to be strong and also to resist corrosion, and the pipes used by the industry meet both these requirements. Where mains and services are known to be in bad condition they are renewed, but the number of deaths—averaging 1.3 per mill. consumers for the four years quoted—shows that the risk from escapes of this nature is very small.

The report of the Home Office Standing Inter-departmental Committee on Accidents in the Home places the commonest kinds of fatal accident in the following order of importance: falls 53 per cent., burns and scalds 13 per cent., suffocation 12 per cent., and, last, coal gas poisoning 8 per cent. Whatever the relation of gas accidents to the total—and the figures for gas accidents include open verdicts—the industry is very much concerned to see that the use of gas shall be as safe as possible and proof against human carelessness as well as physical disability.

Yours faithfully,

F. G. BREWER,

Secretary, Gas Council.

Institution Autumn Research Meeting Programme

THE 20th Autumn Research Meeting of the Institution of Gas Engineers will be held at Church House, Westminster, S.W.1, on Monday and Tuesday, November 22 and 23, under the Presidency of Mr. W. K. Tate, M.A., A.M.I.C.E. Special attention is called to the fact that this year's meeting is on a Monday and Tuesday instead of Tuesday and Wednesday, as has been the custom for many years. The following programme has been arranged:—

Monday, November 22

9.30 a.m.: Opening. Presentation and discussion of the 15th Report of the Chairmen's Technical Committee: 1953-54. (*Comm. No.* 452.) Presentation without discussion of the Sixth Arthur Duckham Research Fellowship Report. (*Comm. No.* 453.)

10.15 a.m.: Presentation and discussion of the 31st Report of the Gas Education Committee. (*Comm. No.* 454.)

11 a.m.: Presentation of Diplomas and prizes.

11.15 a.m. to 12.15 p.m.: Presentation and discussion of paper, 'Chemical Research at the Direction des Etudes et Recherches du Gaz de France,' by P. C. Agron, Assistant Manager, Direction des Etudes et Recherches du Gaz de France. (*Comm. No.* 455.)

3 p.m.: Presentation and discussion of papers (*a*) 'The West Midlands Approach to the Gasification of Residual Oil,' by G. le B. Diamond, Chairman, W.M.G.B. (*Comm. No.* 456.) (*b*) 'The Production of Town Gas by the Catalytic Gasification of Petroleum Oils—Part II,' by H. Stanier (Chief Chemist), and J. B. McKean (Chemical Engineer), S.E.G.B. (*Comm. No.* 457.)

4.15 p.m. to 5.15 p.m.: Presentation and discussion of paper, 'Disposal of Products of Combustion from Gas Appliances,' by A. R. Bennett (Research Manager), and H. Reichert, Dr.-Ing. (Research Engineer), Radiation Ltd. (*Comm. No.* 458.)

Tuesday, November 23

9.30 a.m.: Presentation and discussion of paper, 'Investigations with a Small Pressure Gasifier. Part I—The Study of the Reactions Occurring in the Fuel Bed,' by D. Hebden and K. W. Foley, Birmingham Research Station, Gas Council. (*Research Comm. GC*14.)

10.30 a.m.: Presentation and discussion of paper, 'A Cooling and Condensing System on a Large Carburetted Water Gas Plant,' by L. Silver, London Research Station, Gas Council. (*Research Comm. GC*15.)

11.30 a.m. to 12.30 p.m.: Presentation and discussion of the 45th Report of the Joint Refractories Committee, 1953-54. (*Research Comm. GC*16.)

2.30 p.m.: Presentation without discussion of paper, 'Utilisation of Methane,' by F. E. Mills and J. A. Prigg, London Research Station (Watson House). (*Research Comm. GC*21.)

2.35 p.m.: (*a*) Presentation without discussion of report from the Joint Research Committee on Effluents, 'An Investigation into the Composition of Ammoniacal Liquor. I—Continuous Vertical Retort Liquor,' by W. H. Blackburn, L. Barker, and J. R. Catchpole, University of Leeds (*Research Comm. GC*17.) (*b*) Presentation and discussion of paper, 'A Review of Current Research Work on the Treatment and Disposal of Liquor Effluents from Gasworks,' by A. L. Roberts and W. H. Blackburn, University of Leeds. (*Research Comm. GC*18.)

3.20 p.m.: Presentation and discussion of paper, 'Coal Travel in Continuous Vertical Retorts,' by C. H. Lewis, London Research Station. (*Research Comm. GC*19.)

4.5 p.m.: Presentation and discussion of paper, 'Primary Air Entrainment in Gas Burners,' by W. A. Simmonds, Birmingham Research Station. (*Research Comm. GC*20.)

4.50 p.m. to 5.15 p.m.: Concluding business.

Diary

Nov. 11.—EASTERN JUNIORS: 'Scientific Management and the Gas Industry,' by R. Wells, and 'The Selection of Electric Motors for Driving Gas Compressors,' by D. F. Rudge. Demonstration Rooms, Eastern Gas Board, Spalding. 2.15 p.m.

Nov. 12.—SCOTTISH JUNIORS (WESTERN DISTRICT): 'The Fairweather,' G. Campbell and R. Rae. 522, Sauchiehall Street, Glasgow, C.2. 6 p.m.

Nov. 15.—EASTERN G.C.C.: Connaught Rooms, Great Queen Street, W.C.2. 2 p.m.

Nov. 15.—WEST MIDLANDS G.C.C.: Gas Offices, Edmund Street, Birmingham, 3. 2.30 p.m.

Nov. 15-20.—PUBLIC WORKS AND MUNICIPAL SERVICES CONGRESS AND EXHIBITION. Olympia.

Nov. 16.—LONDON AND SOUTHERN SECTION, I.G.E.: Meeting *cancelled.*

Nov. 18.—EASTERN SECTION, I.G.E.: 'Ten Years Experience with Automatically Operated Water Gas Plants', H. C. Dunbar, Works Engineer, St. Albans; 17, Grosvenor Crescent, 2.30 p.m.

Nov. 18.—LONDON JUNIORS: Afternoon visit to Ford Motor Co., Dagenham.

Nov. 20.—MANCHESTER JUNIORS: Joint visit to Bradford Road Works with Yorkshire Juniors. 'Concentrated Ammonicial Liquor Plant Operation,' D. Astbury.

Nov. 22-23.—INSTITUTION OF GAS ENGINEERS: Autumn Research Meeting, Church House, Westminster.

Nov. 25.—MIDLAND JUNIORS: Visit to works of John Thompson, Ltd., Wolverhampton.

Nov. 25.—NORTH THAMES G.C.C.: Westminster City Hall, Charing Cross Road, W.C.2. 2.30 p.m.

Dec. 3.—LONDON JUNIORS: Annual Reception and Dance, Caxton Hall, St. James's Park, London, S.W.1. 6.45 p.m.

Dec. 7.—MIDLAND JUNIORS: 'Repairing a Bench of Vertical Retorts and the Extra Therm,' H. Kettlewell. Birmingham.

Dec. 7.—SOUTH EASTERN G.C.C.: Caxton Hall, London, S.W.1. 11 a.m.

In this exclusive article our contributor indicates the opportunities which await the British gas appliance manufacturer in the Canadian market and refers to an organisation which aims at exploiting these opportunities

Canadian Natural Gas and the British Gas Appliance Manufacturer

By WILFRED ALTMAN

POST-WAR prospecting for petroleum in Alberta and in British Columbia has revealed new sources of natural gas which may well provide enormous scope for British manufacturers of industrial and domestic gas appliances. This development has actually spread beyond Alberta and British Columbia. According to the latest information, there are possibilities of finding quantities of natural gas also in Saskatchewan, Manitoba and the North West Territories. But the main sources of natural gas now being developed are those in Alberta. They are scattered in an area 200 miles wide—up to the Saskatchewan border and 350 miles northward of the American border. The lower part is linked to Calgary, the northerly part to Edmonton. Gas is obtained from oil-fields in this area as well as from purely gas fields.

In Alberta, construction of what will be the world's largest pipeline—2,240 miles long, and running through Alberta, Saskatchewan, Manitoba, Ontario to Montreal in Quebec, is scheduled to commence early in the new year. Last May, the Alberta Government granted to Trans-Canada Pipe Lines, Ltd., a permit for the export of 4.35 billion (U.K.) cu.ft. of natural gas over a period of twenty-five years, such export at a maximum rate of 540 million cu.ft. per day, to begin not later than December, 1955. Thus, Winnipeg is expected to have supplies of natural gas by late 1955 and such important cities as Toronto and Montreal by 1956. They will be served with supplies of natural gas pumped through Canada's largest fields at Pincher Creek, where every single gas well yields up to 164 million cu.ft. per day; up to 540 million cu.ft. are to be exported daily.

This development—which Canadian business men naturally herald with unrestrained excitement—opens up enormous new markets also for British manufacturers of gas-operated appliances and plant for industrial and domestic usage.

By 1961, according to official estimates, the number of potential new domestic customers in the areas served with natural gas will be two million houses. At the same time, there will probably be 90,000 commercial users—*i.e.*, stores, warehouses, hotels and schools. Although large industrial users (who at present buy their fuel at bulk prices) are not likely to change over to natural gas rapidly, there is expected to be a substantial demand for it as an alternative fuel.

Nonetheless, the call for new equipment will be enormous, even if only a small proportion of potential customers switch to natural gas. The domestic requirements will be for hot air furnaces, central heating boilers, radiators, cookers and water heaters. Similar, but larger equipment will be needed by commercial undertakings. Industrial plants will call for boilers, gas burner units and other specialised equipment.

The British manufacturers who is keen to enter this great potential market is faced with the following problems:—

1. The need for close contact with available opportunities.
2. The need to modify his range to suit the market.
3. The need to engage in costly and extensive advertising.
4. The need to stock spare parts on the spot.
5. The need to act quickly.

1. The need for close contact with available opportunities.

There is bound to be considerable competition for this great new market for domestic and industrial gas appliances. To keep fully abreast of local needs calls for an agent or indeed a subsidiary company which is actually on the spot.

2. The need to modify his range to suit the market.

Not only are Canadian designs more advanced than ours, but they must be approved by the Canadian Gas Association before application can be made to offer them for sale. Frequently, there are also local stipulations. In Alberta, for example, they must be approved by the City of Edmonton Gas Approval Board.

3. The need to engage in costly and extensive advertising.

In a country as vast as Canada, a planned, large-scale advertising programme is an accepted necessity. Attempts to market British products have often failed because there has been no planned advertising. Advertising in Canada, moreover, is on a larger, bolder scale than we are accustomed to in Britain. A Canadian manufacturer advertising gas equipment would normally take up a whole page in a variety of national and local papers.

4. The need to stock spare parts on the spot.

Nobody in Canada wishes to buy equipment for which no service or spare parts are 'laid-on' locally.

5. The need for quick action.

As the pipe-laying is about to commence, American, German and other competitors are surveying opportunities in this field of industrial and domestic gas appliances with keen interest. For British manufacturers, willing and enterprising enough to enter this potentially rich market, there is no time to be lost. Three years ago, in fact, the Board of Trade in its report on the Natural Gas Development in Alberta, stressed the opportunities for gas appliances and advised British firms to investigate the possibilities without delay. 'The sooner such a survey is made,' said the report, 'the better. Otherwise the cream of the market will be lost.'

A former oil man, Major J. N. Watson, who foresaw the possibilities for selling British-made gas appliances in this new market—and who is known to many firms of gas appliance manufacturers, has been working on an interesting project for the past year. In consultation with Mr. T. L. Bonstow of the Council of British Manufacturers of Petroleum Equipment, and the Society of British Gas Industries, Major Watson has reached the conclusion that the only way in which to enter the Canadian market effectively with gas appliances is to combine forces. In other words, instead of a number of individual firms each attempting to break into this rich market individually and experiencing all the disadvantages of so doing, Major Watson's idea is that they could achieve far greater success by co-operating together and setting-up a joint selling group in Canada. In this way, such problems as market research, advertising, distribution, stocking and servicing, publicity and selling can be tackled more economically and effectively than any single firm could hope to do.

In an exclusive interview, Major Watson told the writer that both Canadian advertising consultants and bankers had advised him that a combined effort on the part of British gas appliance manufacturers was the only method by which Britain could hope to win this market.

'Several Canadian sources,' said Major Watson, 'have stressed to me the fact that it would be a mistake for any manufacturer of a narrow range of equipment to offer his

(*Continued on page 398.*)

BREEZE BURNING for STEAM RAISING*

by C. H. G. HAYWARD, A.M.I.MECH.E., M.I.MAR.E., M.INST.F.,
General Manager, Stoker Works, Edwin Danks and Co. (Oldbury), Ltd.

ACCORDING to recent statistics, about 27 mill. tons of coal are used annually in gas manufacture. Of the coke produced in the process of carbonisation, about 10% is in the form of coke breeze, which is roughly 3 mill. tons. In the present state of the coal industry, it is essential that this fuel—which at various times has been used for road making, breeze blocks, and even dumped into the sea—should be used efficiently.

The main problem in burning breeze, as compared with bituminous coal, is one of ignition, and the three most important characteristics concerning this are volatile matter, reactivity and moisture. The volatile matter will vary mainly due to the method of carbonisation being about 2% to 4% with verticals, 1.0% to 3.0% in horizontals and about 1.0% in coke ovens for furnace coke. The reactivity of a coke does give an indication of its ignition properties and typical C.A.B. values are given for various fuels in Table I. Moisture will vary considerably depending on whether the coke is dry quenched, or if wet quenched, the extent to which the breeze has been allowed to drain. Moisture can thus vary from about 5.0% to over 25%.

A further constituent which has an important bearing on combustion, and, generally speaking, a somewhat lesser effect on ignition, is the nature and percentage of ash present. Ash will only have a retarding effect on ignition when the percentage is high, say, over 20%. Its effect on the combustion of coke is to cause clinker formation, and is due to its presence throughout the structure of the coke, whereas in coal, ash is mainly present in the form of shale or loose dirt from above or below the seam. Furthermore, most of the good coking coals are usually high in sulphur and this tends to lower the melting temperature of the ash on the grate. This temperature can be quite different from the ash fusion temperature as determined in the laboratory, as the method of determining the latter bears little resemblance to the conditions obtaining in practice.

For some years now the need has been felt for a "burnability" test, which, in simulating combustion on a grate, would embrace all the characteristics referred to above. Tests of this type are carried out in the pot furnace, and a considerable amount of work on all types of coal has been done in the country by Babcock and Wilcox, Ltd., and others. Unfortunately very little work appears to have been done on coke. A typical test on an Australian coke breeze is given in Tables II and III.

These tests were carried out using air at 300°F., to determine the effect of moisture. With cold air the combustion rate on the "as received" breeze was slightly lower than 200,000 B.Th.U./sq. ft./hr. The ash was in the form of a pancake clinker and rather difficult to break up. The effect of moisture is clearly shown up by the pot test, which shows that when the moisture was reduced to under 15% the burning rate was nearly doubled as compared with the "as received" moisture. The grit carry over given in the last column of Table III is, of course, that applying to a pot test only, but it does give a very good indication of what may be expected in practice. Whilst the pot test was carried out using preheated air, it is very doubtful whether an air heater could be justified in practice, having in mind the high capital cost and maintenance due to the possibility of sulphur attack, quite apart from the necessarily higher maintenance on the firing equipment.

Another feature of coke breeze which has an important bearing on its combustion is its fuel bed resistance. Compared with coal, of about the same grading analysis, the fuel bed resistance to air flow with coke breeze is about double that of coal. On hand firing this means that where there is segregation or a slightly thinner fuel bed, holes are blown in the fire much more readily than with coal. With chain grate firing very little active combustion taken place at the front of the grate and the breeze is actually burnt at a relatively high rate over a short length of the grate. It will be seen, therefore, that unless the average rate of combustion is kept low serious carry-over of grits is unavoidable with any method of firing, although due to the thinner undisturbed fuel bed, carry-over is considerably less with chain grate firing.

Except in the larger gasworks where water tube boilers, chain-grate-fired, are usually employed, the more common type of boiler in use is the shell boiler. In most cases the Lancashire boiler is the popular choice and quite commonly the 30 ft. by 8 ft. is adopted. The average efficiency of hand firing with lump coke on a Lancashire boiler is about 55%. Due to the search for increased efficiency in recent years there has been a trend towards Economic boilers of the medium velocity type, the efficiency of the latter being about 10% higher than that of the Lancashire.

There are three principal methods of firing breeze for steam raising purposes. Hand firing with steam or fan forced draught, sprinkler firing on to a fixed grate with steam or fan forced draught and chain or travelling grate with forced

TABLE I

Fuel	C.A.B. Value
Wood charcoal	0.003
Low temperature coke	0.018
Anthracite	0.035
High temperature coke (gas)	0.057
High temperature coke (oven)	0.070

TABLE II

	As received
Calorific Value (B.Th.U. per lb.)	7,720
Proximate Analysis (per cent)	
Moisture	25.8
Volatile matter	1.0
Fixed carbon	54.4
Ash	18.8
Grading (per cent)	
Through 1 in.	100
,, ¾ in.	91
,, ½ in.	83
,, ⅜ in.	73
,, ¼ in.	60
,, ⅛ in.	43
,, ☆ in.	26
,, ☆ in.	14
Initial deformation temperature in semi-reducing atmosphere (°C.)	1,040
C.A.B. Value	0.051

TABLE III

Combustion Rate

Test No.	Moisture %	Combustion rate B.Th.U./sq. ft./hr.	Rate of downward ignition travel ft./hr.	Carbon in ash %	Carbon in grit %	Carbon grit carry over %
5	25.8	250,000	1.03	6.5	66.6	10.7
6	13.8	426,000	2.14	6.8	68.9	11.8
7	3.2	449,000	2.79	6.0	70.5	10.3

* Abstracted from a paper presented to the Institution of Gas Engineers, Midland Section at Wolverhampton on October 15.

draught. The first two methods are confined almost entirely to shell boilers, whilst the third has not only been applied to water tube boilers, but also in the last few years to shell boilers as well.

There are a number of hand-fired grates which have been adapted for burning breeze and among the foremost is perhaps the 'Turbine' furnace, in which the forced draught is supplied by steam jets through hollow bars. In some cases a sprinkler has been added to this type of grate, which when operated in conjunction with overhead bunkers, does eliminate the hand shovelling of the fuel. It is claimed that, using an average gasworks breeze, an efficiency of 65% has been obtained with a burning rate of 28-30 lb. per sq. ft. of grate area. Owing to very large percentages of fines in the breeze and its low bulk density it is inevitable that a large percentage of fuel is lost in carry-over with this system of firing unless the load is kept down to a moderate figure. With both these methods of firing, it is more usual to mix a percentage of large coke with the breeze, which has the effect of reducing fuel bed resistance. It is not possible to give a definite percentage for the mixture as this varies with the type of breeze, but up to 50% is not unusual.

Coke breeze has been fired on chain grate stokers on water tube boilers for over 25 years and a brief résumé of various methods adopted may be of value in considering this method of firing on shell boilers. In the early days attempts were made to burn breeze by a straightforward mixture with coal slack. It was found that as the bulk density of breeze is about 24 lb. per cu.ft., as against about 50 lb. per cu.ft. for coal, it was almost impossible to retain a homogeneous mixture after moving it, for example, in bunkers or conveyors, resulting in breeze and coal arriving almost alternately on the grate with disastrous results. Sandwich firing, by which means a layer of coke is fed on to the grate under a layer of coal completely overcomes the problem and it is possible to vary the percentages of the fuels through wide limits. It does involve a very special hopper design and also double chutes and bunkers for the two fuels. Breeze was first burnt alone successfully on the chain grate by what was known as the 'Beckton' setting, which consisted of a double refractory arch above the front of the stoker. By carefully controlling the damper so that a balance over the front of the fire was maintained, a proportion of the hot gases was made to travel over the incoming fuel passed through the space between the two arches and thence through the boiler in the normal way. The maintenance of a balanced draught was, however, rather a critical problem.

The latest development is recirculation of the gases through the fuel bed. The original method of recirculation was to put the first compartment of the stoker under suction by a separate fan, which in turn discharged into the forced draught under the grate. With some types of breeze having a rather higher volatile, it was found that the hot gas drawn through the grate caused tar fog to collect on the fan runner. This called for frequent cleaning to prevent vibration due to the consequent out-of-balance loading. A method of recirculation which has been in use for a number of years on the closed-in forced-draught stoker, is to connect the chamber of the stoker which is in front of the air seals to the recirculating fan, and whilst achieving satisfactory ignition this does reduce trouble with tar fog, although a coke filter is usually fitted at the fan suction.

The chain grate stoker as applied to shell boilers was primarily designed for coal, and the early trials with coke breeze showed that the problem with ignition was similar to that experienced on water tube boilers. It was found that by operating with a pressure in the furnace, ignition could be maintained. The effect of the pressure was to exclude cold air which infiltrated under the firedoor under suction conditions, and reduced the temperature below ignition point. The stoker was already fitted with ports in the firedoor for admitting secondary air when burning coal. The secondary air supply was shut off and by connecting these ports to a source of suction, as for example the side flues of a Lancashire boiler, the hot gas was made to flow over the incoming fuel and maintain ignition without the need for a high back pressure. With an average reactive gas coke it is possible to maintain ignition with between a balance and a very slight pressure.

In comparing this arrangement with water tube practice, it must be remembered that on a shell boiler the flue tube is only just over 3 ft. in diameter. In this space the stoker has to be fitted, with sufficient volume above for combustion, and below for ash removal. The total depth of the grate is about 10 in. whereas on a water-tube boiler the depth of the grate alone is 3 ft., and there is no cooling surface immediately above the grate as with the shell boiler.

The first installation of chain grates on shell boilers was made at Coventry, and the results of tests carried out by the works staff over separate weeks' runs are given in Table IV.

TABLE IV

Lancashire boiler, 30 ft. × 8 ft. Two stokers of 20 sq. ft. each, total grate area	30 ft. × 8 ft. 40 sq. ft.	
	Test No. 1	Test No. 2
Duration of test, days	7	7
Fuel	No. 4 coke nuts $\frac{7}{16}$ in. to $\frac{1}{4}$ in. (round holes)	Fine coke breeze $\frac{7}{16}$ in. to 0 in (round holes)
Proximate Analysis (as fired) (per cent)		
Moisture	10.0	12.3
Volatile matter	1.5	2.7
Fixed carbon	75.3	70.5
Ash	13.2	14.5
	100.0	100.0
Gross C.V., as fired (B.Th.U. per lb.)	10,930	10,520
Grading (per cent)		
Over $\frac{1}{2}$ in.	63.4	9.4
Below $\frac{1}{4}$ in.	36.6	
Over $\frac{1}{2}$ in. to $\frac{1}{4}$ in.		34.4
Over $\frac{1}{4}$ in. to $\frac{7}{16}$ in.		25.0
Over $\frac{7}{16}$ in. to 0 in.		31.2
Fuel fired per hr. (lb.)	967	1,173
Fuel fired per hr. per sq. ft. grate area (lb.)	24.2	29.3
Ashes		
Total collected (lb.)	26,096	28,528
Percentage of fuel fired	16.1	19.5
Fine ash, lb. through $\frac{1}{4}$ in.	11,091	23,887
Fine ash, percentage of ashes	42.5	62.0
Analysis	*Ashes* / *Fine ash*	*Ashes* / *Fine ash*
Moisture	0.2 / 0.3	6.2 / 6.2
Combustible	42.0 / 28.2	2.8 / 60.0
Ash	57.8 / 71.5	91.0 / 33.8
Water		
Evaporated (lb./hr.)	5,270	5,725
Evaporation per lb. fuel (lb.)	5.44	4.87
Temperature inlet econ. (°F.)	63	57
Temperature outlet econ. (°F.)	155	152
Steam		
Gauge pressure (lb. per sq. in.)	93	90
Final temperature (°F.)	640	634
Flue gases		
Temperature leaving boiler (°F.)	695	727
CO_2 leaving boiler (per cent)	11.3	13.4
Air		
Pressure to grate (in w.g.)	0.7	1.0
Draught		
Suction over fires (in w.g.)	0.03	0.03
Heat Balance on Net Calorific Value of Fuel (per cent)		
Overall efficiency of boiler and superheater	61.6	57.5
Loss in flue gases	21.8	19.4
Loss in ash	7.8	11.1
Radiation and unaccounted	8.8	12.0
	100.0	100.0

The efficiency was reasonably good as there was no economiser fitted, and in order to arrive at a figure for grit loss the fine ash below $\frac{1}{4}$ in. was separated from the larger material, as it was considered that the majority of the smaller ash was probably blown over from the grate. The results appear to confirm this, as the combustible in fine ash with No. 4 coke nuts was only 28.2% whereas on the breeze it was 60.4%, also the quantity collected was more than double. The increase in grit loss is also observable in the "unaccounted for" loss which is approximately 50% higher at 12.0% on the breeze. It was as a result of these tests that it was decided to limit the combustion rate to approximately 25 lb. per sq. ft. of grate area, in order to keep grit carry-over down to a reasonable figure. Even so it is considered that the final carry-over of grits to the atmosphere which is associated with a 5% loss would probably cause a nuisance, and therefore grit arrestors are always recommended when burning coke breeze.

In Table V the results of a test at Bilston gasworks on an Economic Boiler fitted with chain grate stokers are given for comparison purposes. It will be noted that the breeze used in this test had a rather high moisture content and a certain amount of difficulty was experienced with ignition at one stage during the test. This plant was fitted with a grit arrestor and actual total loss in fine grit and ash compares very favourably with the previous test. It must be remembered, however, that this latter test was of six hours duration and superintended by the manufacturers whereas the tests in Table IV were of a week's duration under day-to-day load conditions with the normal amount of works staff supervision.

TABLE V

Results of tests on a self contained Economic boiler, using coke breeze on an Oldbury chain grate stoker at Bilston gasworks

Date of test	July 22, 1954
Duration (hours)	6
Specified output (lb. per hr.)	6,000
Fuel	
Proximate Analysis, as fired (%):	
Moisture	23.25
Volatile matter	1.43
Fixed carbon	63.81
Ash	11.51
	100.00
Calorific Value, gross (B.Th.U./lb.)	9,380
Grading (per cent)	
½ in. to ¾ in.	30.6
¾ in. to ½ in.	20.5
½ in. to ⅛ in.	15.7
Through ⅛ in.	33.2
Fuel fired per hr. (lb.)	1,134
Fuel fired per hr. per sq. ft. of grate area (lb.)	28.35
Ashes and Clinker	
Coarse ash collected per hr. (lb.)	109
Percentage combustible	6.47
Grits collected per hr. (lb.)	97
Percentage combustible	63.80
Water	
Temperature entering boiler (°F.)	156
Evaporation per hr. (lb.)	7,153
Evaporation per lb. fuel (lb.)	6.31
Steam	
Gauge pressure (lb. per sq. in.)	94
Temperature (°F.)	334
Flue gases	
Temperature leaving boiler (°F.)	482
CO_2 leaving boiler (%)	13.75
Draught	
Over fires (in. w.g. pressure)	0.12
Boiler exit (in. w.g. suction)	0.15
Air	
Pressure to grate (in. w.g.)	0.88
Temperature to grate (°F.)	76
Heat Balance, on gross calorific value (%)	
Heat transferred to boiler	71.58
Heat loss in dry flue gas	12.68
Heat loss in unburn CO	*Nil*
Heat loss due to moisture in fuel	3.06
Heat loss due to hydrogen	*Nil*
Heat due to combustible in the coarse ash	0.94
Heat loss due to combustible grits	8.30
Balance, radiation and unaccounted	3.44
	100.00

TABLE VI

Results of test on an Economic boiler, using coke breeze on a chain grate stoker at B.C.U.R.A., Leatherhead. Technical Report No. 39.

Duration of test (hours)	4
Specified output (lb./hr.) (on coal)	6,850
Fuel	
Moisture	11.1
Volatile matter	2.9
Fixed carbon	65.6
Ash	20.4
	100.0
Calorific Value, gross (B.Th.U. per lb.)	9,370
Grading (per cent)	
Above ½ in.	8.05
½ in. to ¾ in.	17.55
¾ in. to ½ in.	13.97
½ in. to ⅛ in.	24.47
⅛ in. to ⅛ in.	13.23
Below ⅛ in.	22.73
Fuel fired per hr. (lb.)	579
Fuel fired per hr. per sq. ft. grate area (lb.)	25.4
Ashes and Clinker	
Ash collected + ½ in. per hr. (lb.)	80.1
Combustible in ash	15.3
Ash collected ½ in. per hr. (lb.)	40.9
Combustible in ash (%)	53.5
Water	
Temperature entering boiler (°F.)	82
Evaporation per hr. (lb.)	3,465
Evaporation per lb. fuel (lb.)	5.98
Steam	
Gauge pressure (lb. per sq. in.)	75
Flue Gases	
Temperature leaving boiler (°F.)	596
CO_2 leaving boiler (%)	11.9
O_2 leaving boiler (%)	8.8
CO leaving boiler (%)	0.2
N_2 by difference	79.1
Draught	
Boiler exit (in. w.g.)	0.69
Air	
Temperature (°F.)	82
Heat Balance on Gross Calorific Value (%):	
Thermal efficiency	69.90
Dry gas loss	16.18
Loss due to moisture in fuel and air	1.78
Loss due to hydrogen in fuel	0.76
Loss due to unburnt CO	1.04
Loss due to carbon in ash	9.42
Surface heat loss	1.32
Balance	0.40
	100.00

Another interesting feature is that the volatile matter on the dry basis was about 3.0% at Coventry compared with about 1.8% at Bilston and, of course, the moisture in the Coventry breeze was much lower. The specified evaporation at Bilston was 6,000 lb. per hr. so that the evaporation of 7,153 lb. per hr. obtained on test represented an overload of nearly 20%. The efficiency of 71.58% under these conditions may may be considered satisfactory.

Table VI gives an extract from the results of tests carried out by The British Coal Utilisation Research Association (B.C.U.R.A.). These tests indicated that if the boiler rating was kept at about 55% of the maker's rating on coal, there was little variation in efficiency at burning rates between 20 and 31 lb. per sq. ft. of grate area. It will be noted that there is a negative balance of 0.40%, but the surface heat loss was measured and in most tests this would be included in the 'unaccounted for' loss. The slightly lower efficiency recorded by B.C.U.R.A. compared with that reported at Bilston is mainly due to the lower CO_2 and consequently higher gas loss.

Although efficient combustion of breeze is of prime importance, the figure which concerns management more particularly is the actual cost of steam. The latest figures available gives the sale price of large coke at 105s. per ton and the sale price of breeze 45s. per ton, so that even assuming an efficiency of breeze burning on chain grate stokers of, say, 55%, which is the average efficiency of hand firing a 50% mixture of large coke and coke breeze, there is a saving of 30s. per ton which, when related to the fuel consumption in Table IV, represents a gross saving of about £18 per day per boiler or at least £5,000 per year. Against this there is, of course, the cost of the equipment which would be about £3,000 depending upon the electricity supply, so that the whole cost could be written off in one year.

Coke breeze is admittedly a difficult fuel to burn and results in heavier maintenance on the firing equipment than coal. This increased maintenance is largely associated with the ignition difficulties and corrosion. The average cost of replacement on a coal-fired installation is about 2d. to 3d. per ton of coal. In order to get to some idea of the comparable maintenance on breeze, figures have been obtained over a large number of installations and these vary between 1d. and 17.8d. per ton of breeze. It is an unfortunate fact that in many cases the standard of operation and maintenance are not all that could be desired and this is reflected in the variation in these costs.

In an attempt to reduce difficulties with ignition and thus reduce the demands on the operators, an experiment is at present in progress whereby gases are recirculated through the fuel bed as is the practice on water-tube boilers and it is hoped that it may be possible to give some preliminary results to the meeting.

DISCUSSION

Mr. F. H. Bate, Divisional Engineer, Wolverhampton and District, congratulated the author on his 'very honest paper.' He had stressed the difficulties affecting the jobs and mentioned all the adverse factors—ash, sulphur, moisture and size before mentioning any of the economies that could be effected. He felt that the laboratory test mentioned in the paper under-estimated the effects of high ash content. It was stated that ash would only have a retarding effect when the percentage was over 20%. In practice the effects were felt at much lower figures. Also, he would liked to have seen more figures about the resistance of the fuel bed. This was a fundamental factor as it had a direct influence on the rate of combustion of coke breeze and that, in turn, affected the capital charges of the boiler installation.

Following the example set by the author, he considered first of all the difficult factors confronting the gas engineer when considering the installation of breeze-burning boiler plant. He had to consider the necessary increased size of the boiler, which the author had indicated might be as much as 100% more than when using coal, a special grate, the necessary fans and grit-catchers. All these items increased capital charges and maintenance. Against this could be set the savings to be effected by burning breeze dust. Taking breeze at gasworks' prices not at the figure quoted by the author, they estimated that they could effect an overall saving of about £3,000 per annum when using one boiler of the size installed at Bilston. Against this must be set the capital charges for the extra-sized plant, etc., and the additional maintenance involved when burning

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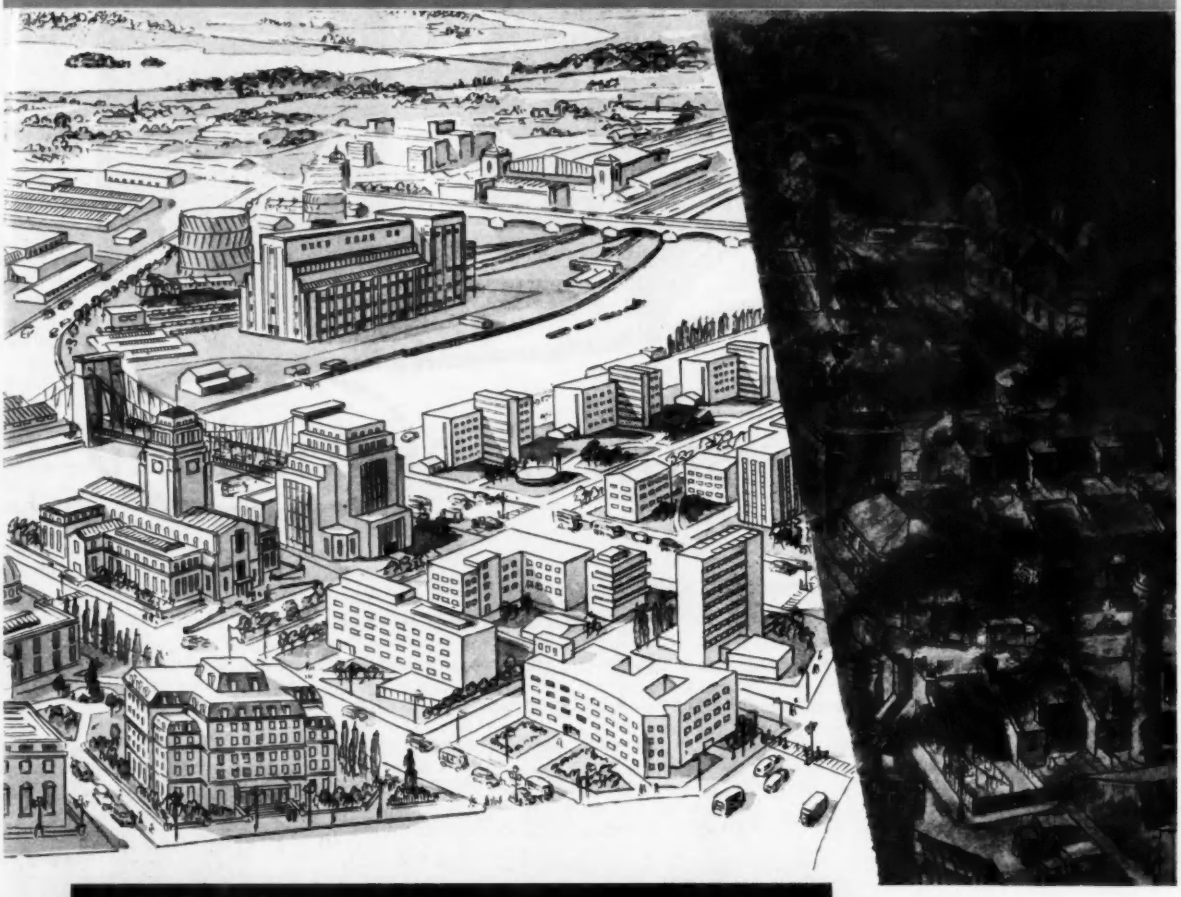

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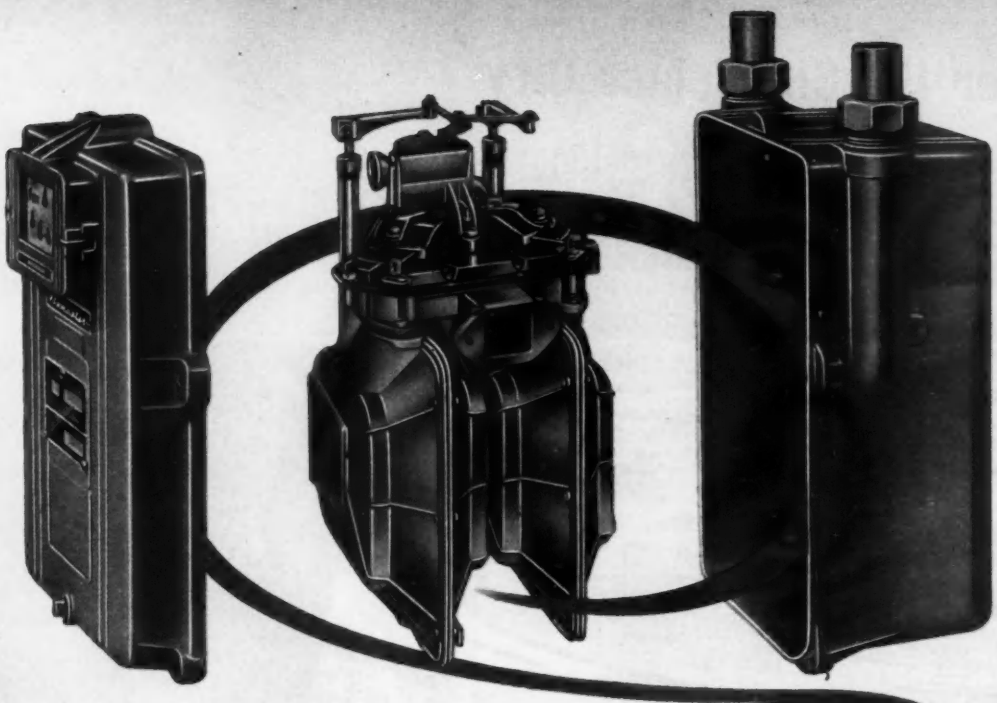

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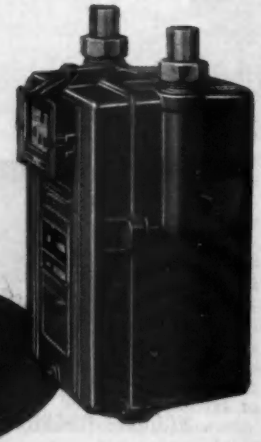

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breeze. They estimated that these additional annual capital charges should be less than £1,000 per annum; thus, the net saving would be approximately £2,000 per annum when burning breeze. Put in another way, the operational savings were reduced by about 30% by additional capital charges for the extra plant and for the extra maintenance involved. The only contribution the gas engineer could make was to try to reduce these extra charges. The boiler under consideration was rated at 6,000 lb. of steam per hour, but when using coal or coke a production of more than 11,000 lb. of steam per hour had been obtained. Thus the extra expenditure on breeze burning could fulfill a dual purpose, as it could also provide reserve capacity within the boiler to meet contingencies such as breakdown of waste heat boiler, etc. Therefore, when planning an installation of boiler plant, the engineer should take into account the inherent reserve within the boiler and reduce expenditure on other reserve plant accordingly. In this way economical provision of dust burning plant could be made

Mr. Hayward replied that in regard to whether 20% ash was not too high, it must be recognised that they had no control over the coal supplied by the N.C.B., as Mr. Bate later admitted. But they could burn breeze fuel reasonably well, it was low rated compared with coal, and they could deal with 20% ash, though they did not like that figure to be exceeded. In respect of fuel bed resistance, he did not think there had been a great deal of work carried out beyond the sphere of the gas boards, and he was without knowledge of what they had done on this problem. He recalled that something was done a few years ago which was the subject of publication, but that was on coal, and said that there was no doubt from the tests his firm carried out in the early days of the prototype stoker, that the fuel bed resistance of breeze was about double; that was, any variation in resistance on the fuel bed was magnified twice over as compared with a similar variation in coal. He was referring to size, he added.

Alluding to the sizing of breeze as something beyond the control of boiler and stoker makers, Mr. Hayward said that on one type of boiler one could re-fire the grates, whereas with a Lancashire boiler, due to the lay-out and flues, it was not a very convenient arrangement. But with regard to the economics of the matter, it was most interesting to hear the point made by Mr. Bate—that while the boiler cost more, inasmuch as they required twice the size of boiler, they did obtain a reserve power available in the event of trouble. One other point was the price of coke breeze. He should explain that his 45s. was the sale price of breeze, and he was fully aware that the price which it cost in gasworks was different.

Mr. W. H. Blundstone gave details of his experience at Hereford gasworks, the difficulties met with and how they were tackled. He touched on the size of breeze, grate speed, the forced draught from the fan being too large for control, and how this was corrected, and various slight alterations made concerning recirculation inside the door and so on, together with (for easier facility of renewals and repair) making the door and hopper removable. He also referred to cost of maintenance, and said the whole problem was bound up with ignition. He added that they were very appreciative of the firm's ready co-operation in giving attention to their wishes at Hereford, and mentioned that their chain stoker boiler was installed two and a half years ago.

Mr. Hayward thanked Mr. Blundstone for his remarks, and congratulated him on the work he had done at Hereford. Having visited the works there a little while back, he could say that without a doubt the folks there had given quite a lot of thought to the problem of burning breeze. The hopper design evolved there his firm liked very much, and the West Midlands Gas Board had kindly agreed that, if and when they so wished, his firm could use this design themselves, for which he sincerely thanked them. But he should add that he believed, owing to the alterations they had made at Coventry, a lot of the trouble which had been experienced at Hereford would be eliminated. Another point he should make was that with the existing arrangements under which Edwin Danks, Ltd., had supplied some 150 stokers—which was quite a large number—to gas boards, if the job was operated properly this trouble of high maintenance did not arise. He knew this to be so; they had proved it. He had referred to the standard of firing which operated in some gasworks, and he had gone to the Birmingham Section to ascertain what was the practice there. Here there was not quite the same arrangement as in some other gasworks he was acquainted with.

Mr. C. E. Mills congratulated Mr. Hayward on a paper which dealt with a problem that was an everyday one for most of them. He thought the figure of 10% for breeze made was on the high side. He would suggest that their first problem was to reduce the amount. However, since they would always have some breeze, particularly whilst continuous vertical retorts were operated, they must ensure that steam in excess of that generated in waste heat boilers was raised from coke breeze. The cost of maintenance to which Mr. Hayward referred, called for comment on their experience. Over a period of 21 months with the three types of installations their maintenance costs on the grates were: (1) Lancashire boilers with forced draught grates, 20d. per ton of breeze burned; (2) Lancashire boilers with sprinkler stokers, 24d. per ton of breeze burned; (3) Economic chain grate stoker, 30d. per ton of breeze burned.

The second point he would like to put was, why equip Economic boilers with two variable controls, *i.e.*, (a) thickness of fuel bed and (b) grate speed? Their experience with the guillotine for varying the fuel bed thickness due to the breakage of ropes and the quality of present day stokers, led them to fit a fixed plough and since that was done they had had much more satisfactory operation and maintained adequate control of steaming. The fuel burned per square foot of grate area varying from 22 to 35 lbs.

Mr. Hayward said he had answered the question of higher maintenance costs in his comments on the position at Hereford, and it was all a matter of the standard of operation. They would all know that there was a type of employee used to having a fixed grate, and he would generally have the mentality which goes with it. Variations in the cost of maintenance had a downward trend now, because somebody was beginning to take an interest in this question as it affected chain grate stokers. Regarding a fixed fire door, they should pay regard to a point raised by Mr. Bate; they might want to burn coal, and if there was a fire door fixed it would restrict the versatility of the stoker. As to fine breeze dropping through the grate, that was a new one on him. 'We have a normal 32nd air space to the grate, and it is difficult to know how you can have breeze dropping through it,' said Mr. Hayward.

Mr. R. G. Warr said the efficient utilisation of solid fuel of every grade was undoubtedly of the greatest importance and he congratulated Mr. Hayward on his concise and informative paper on the use of breeze which was the most difficult to employ efficiently. The figure of 3 mill. tons per annum was most striking and represented a source of an immense number of heat units. A large quantity was used, as he stated, for building materials. In his opinion that was to be deplored when one considered that the heat so dissipated could contribute most markedly to this country's sources of power. The development of design in steam raising plant to enable more breeze to be used, was, therefore, of national importance.

Mr. Hayward observed, in reply to Mr. Warr's comments, that little was called for from him, as that gentleman seemed to agree with him in pretty well every respect. But in regard to the price of breeze, he had gone to some trouble to find out what it was, because he guessed some of them would want to have a word about it. The figure he quoted was the price which the Gas Boards could get for it, and that surely—whatever the price charged within the works—was the sale price as governed by economic conditions, and they could not get round that figure. Coventry used to charge £1 per ton; whether that was the right figure or not he did not know, but that was some time back. The Gas Council assured him that the sale price for the whole country would be on average 45s. per ton.

Mr. T. F. E. Rhead in a written contribution maintained that coke breeze (below $\frac{7}{16}$ in.) was as yet an unavoidable consequence of carbonisation. The cost of its efficient use as a fuel should be viewed against the background of the cost of imported coal which it displaced to a proportionate extent. If improving this relatively poor efficiency—considered over the whole of the coke breeze produced—was too costly for the gas industry and others, then a sensible, integrated fuel policy would take care of this position without unfairness to the gas industry. The principle of a directed fuel policy was practised by both gas and electricity and maybe others in their own industries and the nation was waiting for its application on the national scale.

GUILTY CHIMNEYS

★

'. . . It is a slow, laborious struggle in which we all must fight'

The X-rays reveal the result, the cause is all around us. 'Guilty Chimneys' will be seen during the autumn and winter by local authorities and other interested bodies.

'WHERE there's muck there's brass' is as near accurate a statement today as it ever was. Particularly when applied to the muck that is belched into the air by millions of British smokestacks. The only qualification is that this 'brass' is not recoverable. And what does it cost us? At a conservative estimate, £100 mill. a year; wasted fuel is in the region of 5 to 10 mill. tons a year; and public health is menaced as though by a plague. We of the gas industry know what can be done about this, but ignorance and apathy in other sections of the community must be fought. 'Guilty Chimneys,' a new Gas Council film —which presents this menace in dramatic fashion— is expected to reach an audience of 5 mill. people. They will see a film which must rank high in any class of production. It punches hard and, of course, is constructive in its outlook. With gas and coke to back its arguments how can it fail to be? But cannot this figure of 5 mill. be exceeded? Television has made S.O.S. appeals for witnesses to crime before now. What about asking its 9 mill. viewers to watch out for this killer which deprives innumerable children of the essential Vitamin D; and chokes the living breath out of thousands of the very people who help to make the monster with a fireside shovel? Lime Grove cannot say it is unsuitable. On the contrary, it is far more 'viewable' than many industrial films we are shown. It cannot say it is solely a 'plug.' Most leading industries—including gas—have been featured in some way or another on T.V. 'Guilty Chimneys' talks of the gas industry very incidentally and concentrates on beating home some elementary facts that are not taken seriously enough by otherwise intelligent people.

'Already,' says the commentator, of man, 'he has learned not to cast his waste upon the earth he lives by, to keep his food and water sweet and clean. Two of three great lessons he has learnt, but what of the air which is life itself?'

There is a scene in which children are seen taking their 'supplementaries' at school—orange juice and sun-ray treatment. They are not getting enough sun because we obscure it. But there is an encouraging note. No, it is not the mention of the Beaver Committee; life is too short. It is the fact that smokeless zones are being established and will gain a firm foothold, but '. . . it is a slow, laborious struggle in which we all must fight.'

Vast sums are spent on washing away the accumulated grime from our public buildings. This scene of contrast demonstrates how filthy the air of our cities is.

In this scene from 'Guilty Chimneys' we see a scientist exposing, in laboratory tests, the now established inefficiency of the old-fashioned domestic grate.

FIREDAMP REFORMING*

By J. G. POPE, A.R.T.C., M.INST.GAS E., M.INST.F., and
B. RICHARDSON, F.R.I.C., M.INST.GAS E.

In recent years schemes for draining methane from the rocks enclosing the coal seams, thereby lessening its concentration in the workings, have been put into practice in Belgium, the Saar Basin, and to a lesser degree in Great Britain at Whitehaven and at Point of Ayr Colliery in North Wales. The pits in the Whitehaven area have always been notorious for firedamp, and it is therefore not surprising that in 1948 the decision was taken to explore the possibility of draining the gas from Haig colliery. The results of this work have been explained by Dr. J. H. Jones, Divisional Chief Scientist of the Northern Division of the National Coal Board in a noteworthy lecture given to the Northern Junior Gas Association on April 23 of this year. During his talk Dr. Jones said that the bulk of the gas drained from the workings was burned under the colliery boilers, but he also referred to the fact that the Northern Gas Board was taking a small quantity of firedamp to the extent of 2.75 mill. cu.ft. per month to determine how far it could be utilised for town gas supply. The object of the present paper is to describe the technical and experimental aspects of the work so far carried out by the Board first in its laboratories and then on the practical scale at Whitehaven gasworks.

As far as the authors are aware no other investigation on these lines has been carried out in this country. As it is, the work is even now by no means complete so that financial and economic considerations cannot as yet be discussed except in the merest outline. The co-operation of the National Coal Board is acknowledged and its approach to the problem of methane drainage at Haig Colliery is worthy of the highest praise. The authors feel, indeed, that the work provides a very good example of two nationalised industries collaborating to serve the best interests of the nation.

Conditions at Whitehaven gasworks were very suitable for our purpose, as the decision had already been taken to cease manufacture there and to extend the coke oven gas grid supplying the Ennerdale area to include Whitehaven. The idle plant at the works could then be used to handle the firedamp, any fluctuations in the intake of the colliery gas being taken up by gas drawn from the grid. Accordingly a pipeline was laid to connect the Whitehaven gasworks with Haig pit, and in July, 1953, delivery of firedamp commenced.

Reasons for Adopting Reforming

Before this stage was reached, however, there were several problems calling for investigation and solution. In the first place the properties of methane itself had to be considered. Although the gas possesses a high calorific value its flame propagation rate is so slow that if it were fed to the burners of a gas appliance designed and adjusted to consume a normal type of town gas, there would be great difficulty both in igniting it and persuading it to keep alight. Accordingly the methane must be so modified that it can be used either alone or mixed with a proportion of other gases without adversely affecting the performance of existing apparatus to any perceptible degree.

The alternative to this would be to convert the whole of the burners in the distribution area to burn firedamp, a policy which does not seem prudent having regard to possible variations in quality of the gas, and to the fact that an outlay of £8 per domestic consumer would probably be required to cover the cost of burner conversion throughout the district.

At Whitehaven three possible methods presented themselves for diluting the firedamp to yield a mixture which would conform to the combustion characteristics and calorific value of the gas supplied to the town. These were to use either (a) blue water gas, (b) producer gas, or (c) reformed gas from the firedamp itself.

In connection with (a) a series of tests was made on firedamp—blue water gas mixtures in the Redheugh laboratory of the Northern Gas Board. The firedamp was supplied from the Point of Ayr colliery, and was of exceptional purity, containing 96% by volume of methane and only about 3.3% of air.

A mixture of firedamp and blue water gas proportioned to give the same calorific value as normal town gas (475 B.Th.U.) was made in a test-holder of 10 cu.ft. capacity. This was found to yield excellent results in incandescent burners and water heaters, but in the aerated burners of a gas cooker the flames were distinctly shorter than those resulting from the combustion of the town supply even after the pressure had been increased by 1 in. w.g. The conclusion reached was that a firedamp—blue water gas mixture could be used in existing appliances over the calorific value range 470 B.Th.U.-520 B.Th.U. without the necessity for adjustments, and without any inconvenience to the consumers. Above and below the limits stated adjustments would probably be required.

The disadvantages of the cyclic water gas process are compensated to some extent by the ability of a blue water gas plant provided with an oil carburettor to manufacture carburetted water gas should the firedamp supply fail. Where, therefore, a carburetted water gas plant and ancillary equipment are installed, this method of dilution may prove to be the most economic and satisfactory of any, but purification of the resulting gas from sulphuretted hydrogen will be necessary, which is not the case when reformed firedamp is the diluent.

Weighing up all these factors and in view of there being no water gas plant of any description at the Whitehaven works, it was considered that an alternative to this scheme should be sought. The most obvious one was to dilute the firedamp with producer gas. This, however, possessed most of the objections inherent in the use of water gas, and, furthermore, the diluted gas, would, without doubt, have given rise to trouble in the distribution system. Experiments led to the conclusion that as a practical proposition dilution of firedamp by producer gas could definitely be ruled out of court.

There remained the prospect of obtaining the diluting gas from a part of the firedamp itself either by reforming with steam over a catalyst, or by cracking it to hydrogen and lamp black in the fuel bed of a water gas plant generator. The latter process in addition to being cyclic in nature involves the degradation to solid carbon of a part of the thermal content of the firedamp which might amount to as much as 22% in the case of pure methane and up to 14% or 15% for the firedamp available at Whitehaven. Furthermore, as already stated, there was no water gas plant installed at the works.

Reforming, however, is a continuous process with no degradation taking place, although fuel must be supplied to the furnace. The heat balance depends upon the design, loading, and efficiency of the latter. The fuel may be part of the fire-damp itself if this is convenient. Accordingly, the decision was made to investigate the possibilities of reforming, and, if these showed promise, to proceed with the erection of a pilot plant on the Whitehaven works.

Preliminary Laboratory Work

Reforming is affected by passing a mixture of methane and steam through a heated catalyst bed in order to promote the reaction expressed by the following equation:—

$$CH_4 + H_2O = CO + 3H_2$$

This reaction is strongly endothermic and supplies of external heat are necessary if it is to be used as a continuous

* Abstracted from a paper at a joint meeting of the North of England Section of the Institution of Gas Engineers and the Northern Junior Gas Association, October 21, 1954.

process. By theory, approximately 250 B.Th.U. of heat are absorbed per cu.ft. of pure methane treated, and if the heat is derived from producer gas generated from coke, the consumption of the latter, without the provision of heat exchangers and a waste heat boiler, might be expected to reach or even exceed 25 lb. per 1,000 cu.ft. of methane converted into carbon monoxide and hydrogen.

Study of available literature and the result of our own work in the laboratory led to the conclusion that the most likely catalyst to meet our requirements was nickel. At Redheugh and later at Whitehaven the nickel catalyst was prepared for the laboratory experiments as follows. Firebrick broken down to pea size was soaked in a strong solution of nickel chloride which by the action of ammonia was converted into nickel hydroxide. The impregnated material was then heated to about 1,000°C. to convert the hydroxide into oxide and to drive off the ammonium chloride. Batches of activated firebrick containing from 3% to 4% by weight of nickel oxide were employed in the experiments. Satisfactory results could be obtained with firebrick containing from 2% to 3% by weight of nickel and at temperatures between 850°C. and 950°C. Under these conditions and employing a contact time of about 1 sec., firedamp from the Point of Ayr Colliery (methane content 96%) could be reformed to give a gas of a calorific value of from 325 B.Th.U. to 360 B.Th.U. per cu.ft., and occupying a volume from 2.8 to 3.3 times that of the original firedamp.

Laboratory experiments at Redheugh, subsequently confirmed on the semi-works scale at Whitehaven, indicated that the best results could be obtained if a quantity of steam was used equivalent to about 45 lb. per 1,000 cu.ft. of methane present in the firedamp.

Up to this point laboratory work had been conducted on firedamp from Point of Ayr Colliery. This mine is exceptional in Great Britain in that a steady flow of gas under considerable pressure can be obtained by simply drilling down from one seam to the unworked seam below. In consequence the evolved gas is of exceptional purity and regularly contains over 95% by volume of methane. In contrast to this, at Whitehaven, the present method of induced drainage employed results in the methane content of the gas drawn from the workings constituting about 75% by volume of the total. When reforming such a gas containing from 20% to 25% by volume of air it might reasonably be expected that the throughput of the plant or apparatus could be increased, as with this proportion of included oxygen the reactions would proceed along the lines of the two equations:—

(a) $CH_4 + 0.5O_2 = CO + 2H_2$

(b) $CH_4 + H_2O = CO + 3H_2$

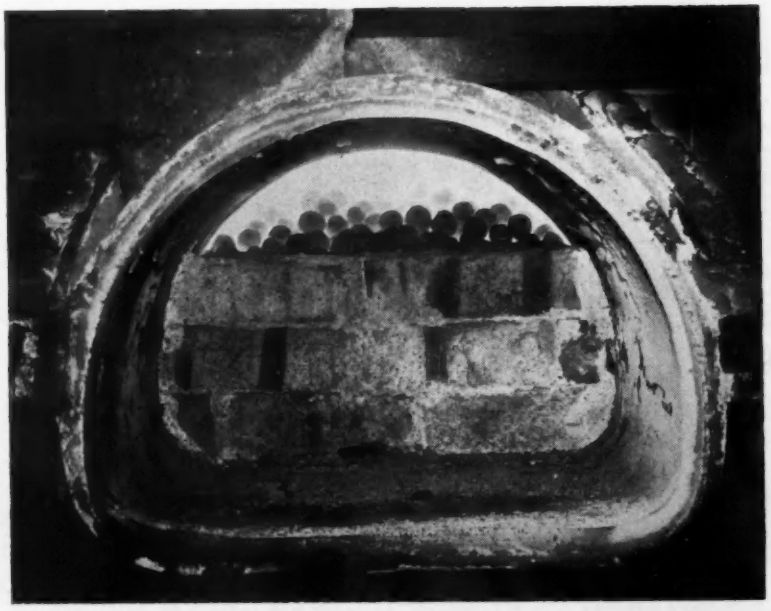

Fig. 1. Retort at Whitehaven gasworks altered for firedamp reforming and showing catalyst filling.

TABLE 1

	(A) Whitehaven firedamp	(B) Reformed gas	(C) Mixture of A & B	(D) Whitehaven town gas
	%	%	%	%
CO_2	2.5	2.2	2.3	2.5
O_2	4.5	0.0	1.5	0.5
C_nH_m	—	—	—	2.0
CO		18.9	12.6	5.0
CH_4	72.0	8.7	29.8	24.5
H_2	—	61.0	40.6	52.0
N_2	21.0	9.2	13.2	13.5
Gross C.V. (B.Th.U.)	720	350	470	477
Sp. Gr. (air = 1)	0.696	0.426	0.490	0.415
A.T.B. number	off scale	36	75	76
Wobbe index	863	490	671	745

Equation (a) is exothermic, and by counteracting the endothermic reaction (b) will tend to conserve heat in the system.

Investigation of this matter showed that, theoretically at least, the heat absorbed per cu.ft. of Haig firedamp should be about 130 B.Th.U. instead of the 250 B.Th.U. required for complete conversion of an equal volume of pure methane into carbon monoxide and hydrogen. An attempt was also made to calculate the percentage increase in volume which might be expected to take place when firedamp consisting of 72% methane and 25% air is reformed with steam. Two assumptions were made, the first being that oxygen in the added air combines with methane according to equation (a) given above, and the second that 85% of the total remaining methane is decomposed in the apparatus or plant into carbon monoxide and hydrogen. The result showed that 1 volume of such firedamp should under these conditions yield 2.7 volumes of reformed products, which is a figure not greatly different from that obtained in the laboratory apparatus under optimum conditions of operation and with temperatures of 900°C. to 950°C. in the catalyst bed.

The final stage in the preliminary small-scale experimental work was to ascertain the composition and other relevant properties of a mixture of firedamp and reformed gas, so proportioned as to give a gas of the same calorific value (470 B.Th.U.) as that normally supplied to the Whitehaven area. This investigation was made on the Whitehaven gasworks as soon as a supply of firedamp became available and the necessary apparatus could be assembled. Table 1 summarises the results.

Apart from the complete absence of unsaturated hydrocarbons the gas shown in column (C) is not greatly dissimilar from a normal coal-gas water-gas mixture. Actually its combustion characteristics were found to be almost indistinguishable from the mixture of coke-oven and manufactured gas then supplied to Whitehaven, the A.T.B. number of which was about 76. The theoretical quantity of air necessary to burn one volume of the mixture (C) was 4.23 volumes as compared with 4.32 volumes for the Whitehaven gas in column (D).

Preliminary Large Scale Experiments

The first experiments in reforming on the works scale at Whitehaven were made in an old setting of six stop-ended horizontal retorts specially modified for the purpose. These retorts of 21 in. × 15 in. D-shaped cross-section and 10 ft. in length were packed with the catalyst which had been prepared from a fireclay obtained in the vicinity. A strong solution of nickel chloride was added to the damp clay and the two components were intimately mixed. The impregnated material was then moulded into 1-in. diameter balls and fired in a kiln at 1,250°C. until the nickel had been completely converted into the oxide. When this was achieved the light-green balls contained about 2% of nickel.

To reduce the possibility of short-circuiting or channelling of the gas taking place in the catalyst filling, two 4½ in. firebrick walls furnished with checkered openings at the base were provided in each retort. In Fig. 1 an illustra-

tion of a filled and heated retort is shown with impregnated fireclay balls in position.

The incoming firedamp from the colliery was divided into two streams, one for reforming and the other for enriching the reformed gas to the declared calorific value. Each stream was given a volumetric governor and B.M. type of meter to control the flow. Between the B.M. meter dealing with the gas destined for reforming and the retort setting header a hydraulic safety seal was installed. The firedamp-steam mixture passed from the 6-in. diameter header located on the setting top by way of 1½-in. diameter flexible tubes to cored cast-iron blocks built into the back of each retort. Control of steam supply to the header was effected by a reducing valve, followed by an orifice with pressure gauge which served the purpose of a simple steam meter. Heating was effected by producer gas as in normal horizontal retort practice, a temperature of from 950°C. to 1,050°C. being maintained in the catalyst bed.

Rather surprisingly this crude home-made contrivance began to yield promising results when it was put into operation on July 29, 1953. It was found that each retort could deal with up to 400 cu.ft. per hour of firedamp containing 74% of methane, the average daily feed to the setting being, therefore, about 58,000 cu.ft. The reformed gas was taken away from the retorts by means of the works exhauster and washed with a water spray in a tower scrubber before passing through the oxide purifiers in order to remove any trace of hydrogen sulphide which might, conceivably, have been picked up from tar lying in the hydraulic and foul mains. After the purifiers the gas was measured in a Connersville meter and mixed at the holder inlet with a proportion of untreated firedamp so as to give a final product possessing a calorific value of from 470 to 475 B.Th.U.

Under optimum working conditions the percentage composition of the reformed gas was approximately: CO_2 6.4, O_2 0.5, CO 17.5, CH_4 5.2, H_2 49.4, N_2 21.0

The gross calorific value was 270 B.Th.U., the specific gravity 0.67, while the gas occupied approximately 2.3 times the volume of the original firedamp. When added to firedamp to give a gas of 470-480 B.Th.U. the mixture had the following percentage composition: CO_2 4.4, O_2 2.4, CO 8.7, CH_4 39.6, H_2 24.7, N_2 20.2.

This gas could be supplied alone on the district, but on account of its high methane and low hydrogen content there was always the danger of flame-lifting taking place on some of the appliances in use in the area. In practice, therefore, it was deemed advisable always to add a proportion of coke oven gas to the mixture so as to maintain the hydrogen figure at or above 30%. By this means satisfactory combustion characteristics could be ensured, and it was found possible to distribute in the Whitehaven area gas of which 80% by volume consisted of firedamp plus reformed gas. No complaints were reported from consumers.

Gas Odorising

Both the Whitehaven firedamp and the reformed gas produced from it have no distinctive smell, so that the question of imparting an odour to them had to be given serious attention. Up to the time of the closing down of the experimental retort setting, gas distributed to Whitehaven consisted, as already described, of about equal volumes of firedamp plus reformed gas and coke oven gas, the presence of the latter ensuring that it left the works with a definite odour. As, however, it was intended ultimately to dispense altogether with coke oven gas and rely solely upon mine gas for supplying the district, some method of imparting a distinctive smell by artificial means must be devised. Gas odorisers described in patent literature and in the technical Press, include amyl mercaptan ($C_5H_{11}HS$), enanthol (probably identical with heptaldehyde), 'Calodorant,' and 'Pentalarm.' The last two appear to be the substances most commonly used for odorising natural gas in the U.S.A. Cable and others (American Gas Association, 1952) state that most commercial odorants are sulphur compounds—*e.g.*, disulphides, thioethers, cyclic compounds, and mercaptans, with odour strengths ascending in that order. Mercaptans are extensively employed, their odour strengths ascending in the order methyl, ethyl, butyl, propyl, and iso-amyl mercaptans.

Small samples of 'Pentalarm' and 'Oronite' were supplied to us by firms in the United States, and experiments in their use began in the Redheugh laboratory. Both substances are colourless volatile liquids with a penetrating smell. They are sold either diluted for general use, in which case about 10 lb. per mill. cu.ft. of gas is required, or as concentrates, when the odorising rate is about 0.5 lb. per mill. The samples dealt with at Redheugh were of the latter variety, and it was found that their addition to air in the proportion 1 : 99 imparted a smell which, while definitely stronger and more pungent than that usually associated with normal coal gas, was not, in some respects, unlike it.

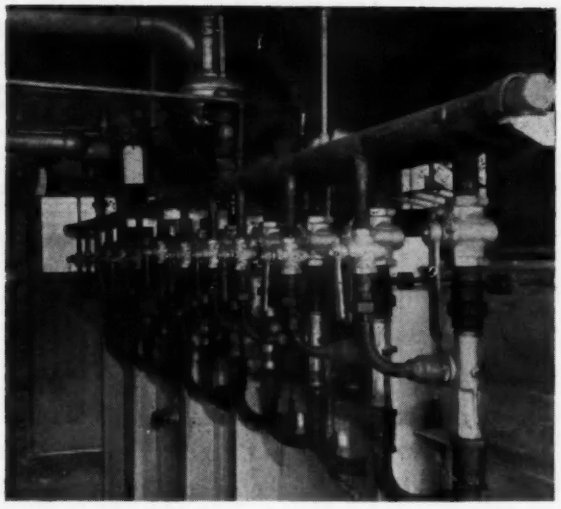

Fig. 2 Whitehaven reforming furnace showing manifolds and heating burners.

Reforming in Tube Reactors

Having demonstrated the feasibility of reforming catalytically a mixture of firedamp and steam, it was decided to investigate the possibilities of carrying out the reactions in heat-resisting alloy tubes. This would enable the process to be conducted under more closely controlled conditions and also permit of a study being made of the behaviour of these tubes when submitted for prolonged periods to temperatures between 900°C. and 1,000°C. A pilot-scale furnace was accordingly designed by Mr. W. A. Lloyd-Dodd, Industrial Sales Manager of the Tyneside Division of the Northern Gas Board, and the authors greatly appreciate and gladly acknowledge his valuable help in this matter.

The furnace itself is of simple construction enclosed in a suitably braced mild steel casing, with reverberatory arch, castellated hearth, and under hearth flues. In it the two heat-resisting alloy tubes are disposed side by side in a horizontal position. Each tube is 18 ft. in length and 8 in. in diameter, but the tubes are of different composition. One consists of 'Pireks 60' alloy (60% nickel, 20% chromium) and the other 'Pireks 20/25' alloy (20% nickel, 25% chromium).

Heating is by 12 burners of the air-blast type supplied by British Furnaces, Ltd., of Chesterfield. The fuel used is firedamp and at maximum capacity the burners consume about 2,700 cu.ft. per hour. The temperature is controlled by two pyrometers which actuate motorised valves in the air lines to each half of the furnace. In the event of a failure in the air supply, a magnetic valve shuts-off the firedamp and simultaneously sounds an alarm.

The burner flames have been found to remain stable for all qualities of firedamp so far dealt with—*i.e.*, they have burnt in a successful manner gas varying in calorific value from 630 B.Th.U. to 740 B.Th.U., and containing from 64% to 74% of methane by volume. The quantity of fuel gas used at the burners is measured by a 3,000 cu.ft. per hour tin-cased dry meter, and to guard against any failure which might take place during a possible short interruption of supply from the colliery an existing small gasholder of 20,000 cu.ft. capacity is normally maintained fully inflated with firedamp. A photograph of the burners is reproduced in Fig. 2.

The firedamp-steam mixture for reforming is fed to the reactor tubes by flexible connections. The hot reformed gas from the furnace is first passed through a sealed wash box

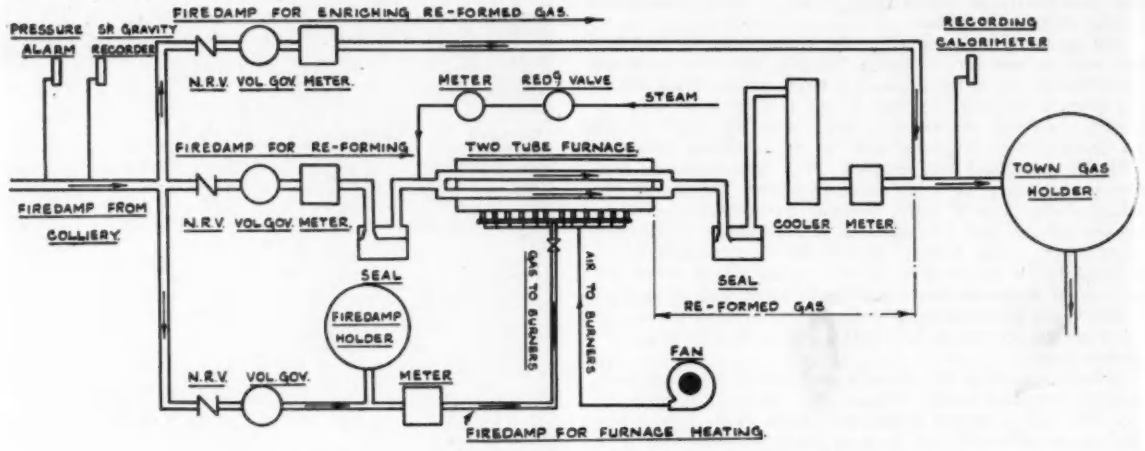

Fig. 3. Diagrammatic arrangement of firedamp reforming plant at Whitehaven.

where it is subjected to a spray of cold water fixed in the inlet pipe; this serves to cool the gas and maintain the washer seal. It then traverses a water tube condenser, and after metering and odorising meets with a stream of untreated firedamp at a point anterior to the holder, the proportion of firedamp being adjusted to give a gas mixture possessing the same declared values as that supplied to the district. The general arrangement of the plant is represented diagrammatically to Fig. 3. The catalyst employed in the reactor tubes is that previously used in the experimental retort setting, since after 10 months of almost continuous operation in the latter its activity did not seem to have perceptibly decreased. The installation was started up on May 12 of this year, and almost at once began to work in a satisfactory manner. When employing temperatures inside the tubes of from 930°C. to 970°C. it was found that up to 85% of the firedamp could be reformed and a volume increase of 2.25 achieved.

Unfortunately, as time went on the quality of the firedamp received from the pit steadily deteriorated, so that, whereas in the middle of May it contained 72% of methane, by the end of July it had fallen to 66%. Frequent analyses of both reformed gas and the reformed gas-firedamp mixture fed into the holder were carried out during this period using a G.L.C. soap-film type of apparatus. A continuous record of the calorific value was also kept on a Sigma instrument, the readings of which were regularly checked by a standard Boys water-flow calorimeter. The average results obtained are given in Table II.

TABLE II

Composition of Reformed Gas and Reformed Gas-Firedamp Mixture. Whitehaven Gasworks, May 12, 1954—July 23, 1954.
Average methane content of firedamp = 67%

	(A) Reformed gas	(B) Reformed gas and firedamp
	%	%
CO_2	1.7	2.0
O_2	*Nil*	1.0
C_nH_m	*Nil*	*Nil*
CO	19.4	13.1
CH_4	9.6	31.6
H_2	59.5	36.7
N_2	9.8	15.6
Gross C.V. (B.Th.U. per cu. ft.)	347	474
Sp. Gr. (air = 1.0)	0.440	0.536
A.T.B. number	37	74

In the meanwhile supplies of 'Pentalarm' had come to hand and it now became possible to odorise the whole of the gas. Once this had been accomplished the way was opened for eliminating the coke oven gas and for feeding the conditioned firedamp mixture alone into the Whitehaven area of supply. As, however, the total daily production, amounting to some 127,000 cu.ft., fell short of the town consumption of gas, it was only possible to carry out this procedure for relatively short periods, when the holder stock position was such that it allowed it.

The composition of the gas was substantially the same as that shown in Column B of Table II, and on these occasions when it was supplied 'neat' to the district its behaviour could not be distinguished from that of the substituted coke oven gas.

Particular attention was then paid to the performance of those appliances which experience had shown to be more than usually sensitive to changes in gas composition, but these did not appear to be perceptibly affected. It should be mentioned that the Wobbe index of normal Whitehaven gas was 710, and that of the prepared firedamp products 650, but the A.T.B. numbers of the two gases were found to be identical, as was also the general aspect of the flames.

(To be continued.)

CANADIAN NATURAL GAS—*concluded from page 389.*

products to a Canadian distributor who handles bits and pieces of equipment from a great number of sources.'

'I have learned,' said Major Watson, 'that the industry has been very badly bitten by agents of this description and as a result customers prefer to buy direct from a source closer to the manufacturer. This, I feel, is a strong point in favour of the type of organisation I want to set up.

'Several Canadian advertising firms have also told me that at the present time there is a grand opportunity for British manufacturers to enter the field with all sorts of gas equipment—for instance:

Industrial gas burners: Atmospheric and blast. A good demand exists for quality products at reasonable prices.

Valves: All sizes and pressures up to 400 and 500 lb. per sq. in. down to small gas cocks and low pressure valves.

Gas cylinders for propane, until piped gas arrives.

Copper tubing and fittings: Liquid petroleum gas has increased sales enormously and the demand is growing.

Pressure regulators of all sizes.

Domestic and commercial gas filters.

Pressure gauges: 0-30 lb. per sq. in. and 0-300 lb. per sq. in.

Fractional horse-power motors.

Metal-melting furnaces.

Industrial torches.

'There are quite a number of other items, complementary to these that can be sold in Canadian markets.'

'One of the best-known men in the Canadian gas industry, who sits on a number of national committees dealing with the industry, feels highly enthusiastic about my idea,' said Major Watson. 'I am equally encouraged by the interest already shown by British gas equipment manufacturers.'

The Board of Trade also has intimated that it would support any project which would further the efforts of British gas appliance manufacturers to exploit fully the opportunities arising out of the rapid expansion of the natural gas resources in Canada. The dead-line would appear to be very close. Already three years have gone by since the Board of Trade pointed out the opportunities; now the group is in active formation.

TECHNICAL PROGRESS . . .

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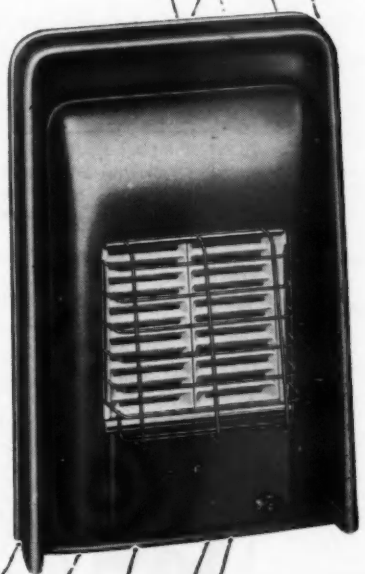

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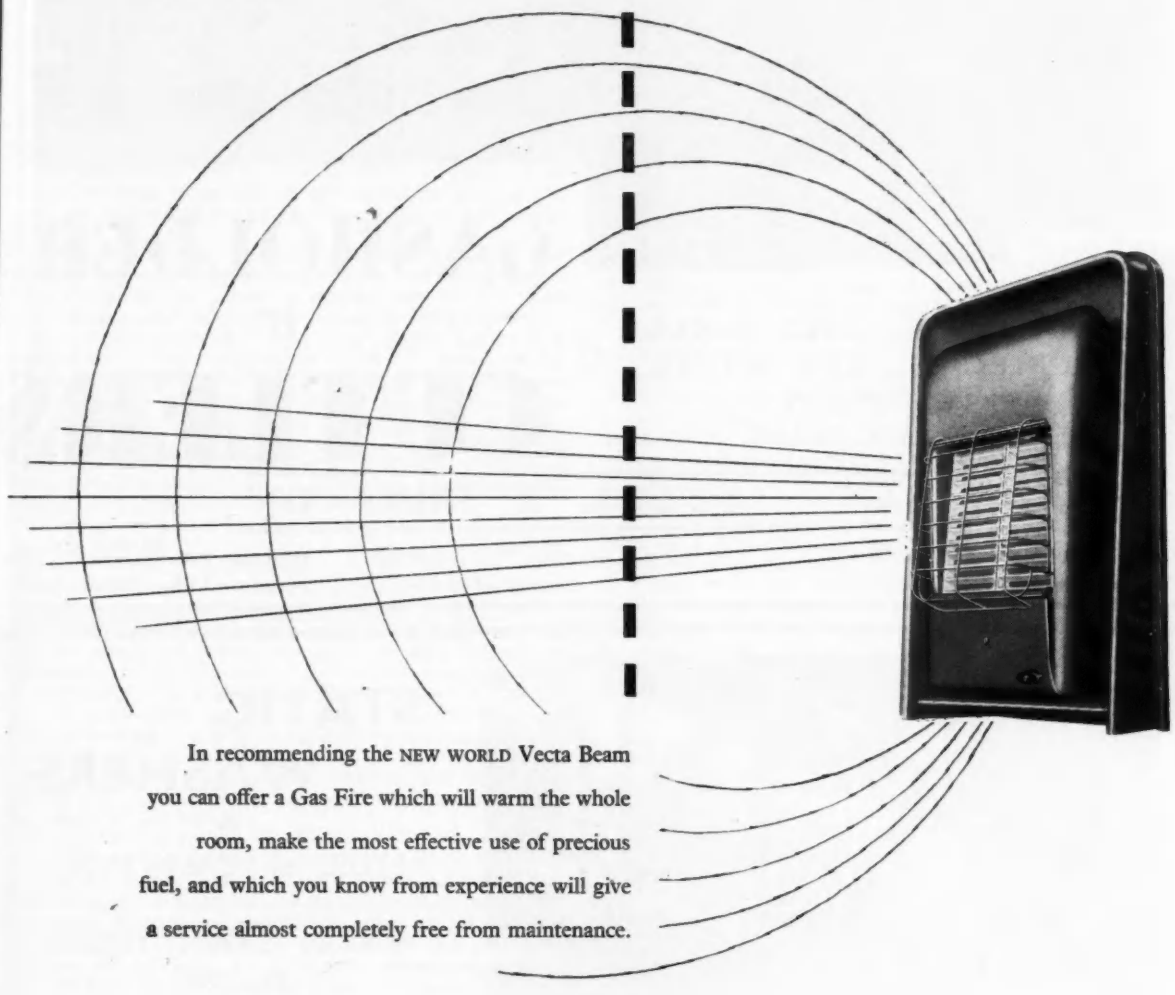

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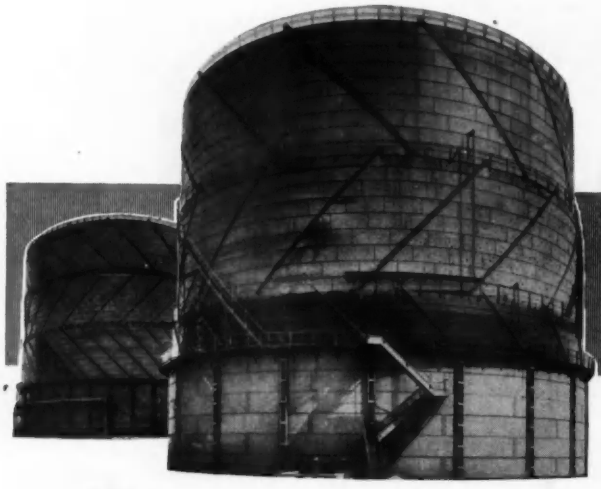

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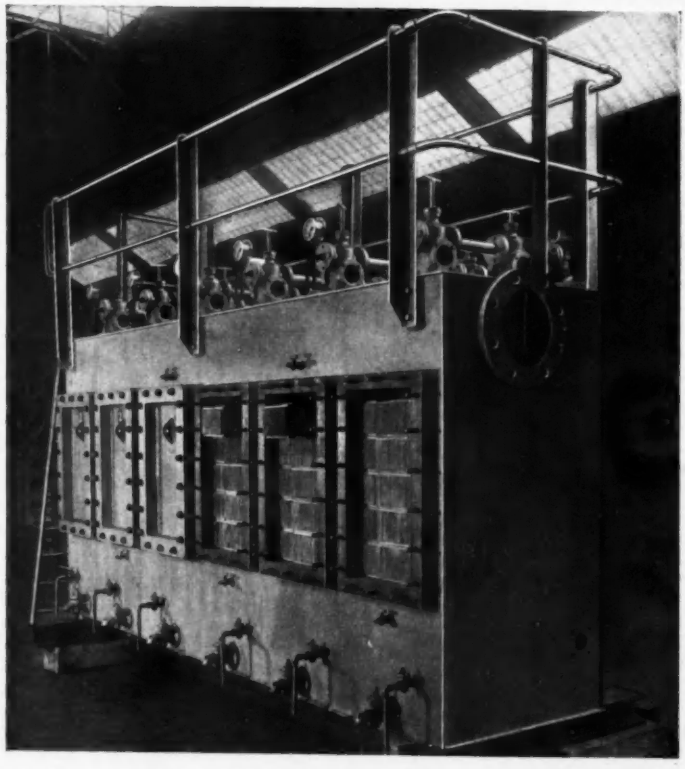

10

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Training of Personnel*

By A. H. BARRINGTON, T.D., ASSOC.M.INST.GAS E., A.M.S.E., M.INST.F.

Station Engineer, Stretford Undertaking, North Western Gas Board.

THE principal reason for the existence of the Junior Association is to assist in the dissemination of technical knowledge, particularly among our younger members. At the Stretford Undertaking of the North Western Gas Board the task of training students is one to which much thought has been given, and for many years a system has been operated by which many gas engineers have been launched into the various branches of our profession. Many of them have attained eminence in the industry throughout the country, and many are represented among the more senior of the Board's staff.

The training scheme which operated prior to vesting day has been continued with only minor changes up to the present time. Originally the period of training was for five years with a special salary scale and conditions of service applicable only to student engineers. Since nationalisation the students salary scale has been brought into the A.P.T. grades and the conditions of those grades have been applied to the students.

There was no obligation on the Stretford Board to find a staff appointment for the student at the end of his five-year period, but, subject to satisfactory service, he was retained on the highest student grade salary until he obtained an appointment elsewhere. More often than not an appointment did become vacant soon after the student's qualification.

To my mind, one of the biggest advantages of this scheme was that after the first 12 months the student was given progressively increasing responsibility. He was made to realise that, although he was receiving a sound grounding in his chosen profession, he was also working for a salary—that he was, in fact, albeit untrained, of some value to his employers. He became accustomed, within the limits imposed by his inexperience, to the responsibility for handling men, and being, as he was, in close contact with them every day, he learned that the men under his control were subject to trials and tribulations similar to those to which he himself was subjected, and that they were deserving of the same consideration in the sphere of human relations. Such lessons, well learned, at this stage in a student's training hold their value throughout the whole of his career.

During the five years of his training the student was given periods in every department of production, works maintenance, distribution, drawing office, and sales, domestic and industrial; and he usually finalised his training in the department found to be most suited to his particular abilities. He also attended evening and/or day classes at the technical college for the purpose of qualifying for Corporate Membership of the Institution of Gas Engineers or other appropriate body.

Establishment of Area Scheme

However, the North Western Gas Board, in fulfilment of its obligations under the Gas Act, has, as we all know, instituted its own training schemes throughout the area. These should give entrants into the industry greater opportunities than ever before to prepare and qualify them to take their part in the efficient operation of the gas industry in all its aspects. The advantages of a scheme applicable throughout our area are manifold. To meet the higher standards called for by modern industry, the period of training has been extended; the experience of the student can be spread over every type of gas-making plant and can cover the most up-to-date technical advances of the industry.

I have heard it said that all these facilities provided for the training of students have made things far too easy for them. So easy, in fact, that the urge to go looking for knowledge and experience for themselves might be reduced, and the student and the industry be the losers thereby. But the improved facilities place upon students the obligation for the maximum possible effort to attain the higher standards required of them. From what I know of the syllabus of the training scheme, without such effort the student will not be able to qualify.

I am well aware that our Board's training schemes are largely in their infancy, but I would appeal very strongly for every opportunity to be given early in the training period for the practice of responsibility by trainee engineers. Give them, as early as possible in their careers, the care of a plant and its operators, subject, of course, to supervision. Let them maintain a working log of their own, a log which must be produced, when required, for inspection by the person responsible for their training and which will be a useful reference book in the future for the student himself.

There is one big drawback to the new training schemes, which applies mainly to those works already operating a programme of their own. The students have, in the past, been attached to a department long enough to learn and be able to carry out the routine work in that department. They become, in fact, useful members of the staff. Under the new schemes the period in each department is relatively short and they are just becoming of some practical use by the time they are due to move to another section. We are told that it is not good practice to use students as 'cheap labour.' Quite apart from the fact that students can no longer be looked on as 'cheap labour,' however, replacement staff will be needed to do the work previously carried out by these students. Having accepted the responsibility for training personnel for the industry, the cost of doing so has to be accepted also, and until such time as the products of the new schemes are available we will have to overcome in some way the shortage of junior staff to handle daily routine work.

Prospects for Entrants into the Industry

It has been stated by those best qualified by experience, that the industry has never offered better opportunities to would-be gas engineers than at the present time. Mr. J. T. Haynes, the Immediate Past President of the Institution, in his Presidential address at Bournemouth last May referred at some length to these opportunities and the manner in which advantage could be taken of them.

The ultimate peaks to be attained in the industry present a different picture from that of pre-vesting conditions. The tendency is to centralise production in the larger stations. Although fewer works managers will be required if this continues, a big plant is usually broken down into units of a size reasonably easy to control. The high efficiencies which must be attained and maintained if the industry is to compete with other fuel industries call for adequate staffs of qualified technicians. Centralised production stations require extensive networks of distribution with competent staff to operate them. The industry depends finally, or initially—according to whether you make or sell the product—on the selling of gas or coke in large quantities to as many consumers as possible. Only by adequate trained sales staff can this be done. It seems, therefore, that the opportunities are as good as—and perhaps even better than—ever, but economic changes outside our own industry call for the greatest possible efficiencies within the industry if we are to survive amid competition. To obtain such efficiencies calls for highly qualified and conscientious technical and administrative personnel. Those of us at present engaged in the industry are doing our utmost to reduce by every means within our power the costs of manufacture and distribution, but it rests in the hands of the young men now entering into the industry to ensure that they will themselves be capable of continuing and, I hope, improving on, our efforts, when their turn comes. The Board has provided the way. Let the entrants to the gas industry provide the will.

* Abstracted from a Presidential Address to the Manchester District Junior Association of Gas Engineers, October 23, 1954.

Some Aspects of Gasification

Mr. William Balmer, B.SC., Technical Assistant in the Lanarkshire Division of the Scottish Gas Board, said recently that a gas production programme designed to use the increasing volume of oil may be a 'short-sighted' one. He was delivering a Jubilee Year paper, 'Some Aspects of Gasification,' to the Scottish Junior Gas Association (Western District) in Glasgow.

'The use of oil in gasification is limited to a long term basis because most of the oil gas processes in this country are still in the prototype stages of development,' he said. 'The cost of gas per therm resulting establishes oil as a major item of cost. In view of the ever increasing demands for the 'waste' products of oil refineries, particularly by the manufacturers of detergents, no material fall in the prices of oil fuels suitable for gasification projects can be expected.' He went on to say that from the national standpoint, the dependence of yet another industry on oil must be viewed with concern because cessation of concessions and unprofitable demands are met with occasionally.

Turning to the quality of coal available to the gas industry, Mr. Balmer said that although Lanarkshire was still the principal source of coal supplies in Scotland, due to the rate of exhaustion of its coal seams the bulk of future supplies would come principally from the more recent sinkings in the Fife and Lothian sections of the Scottish coalfields. To offset the resulting shortage of coking coals, the proportion of Durham coals imported would be increased. His remarks on this subject were limited to Lanarkshire because, as he said, his experience did not allow a wider field of observation.

Continuing, he maintained that with the exhaustion of better quality seams, the proportion of run-of-mine coal from inferior seams was increasing. In itself, this change of fuel characteristics need not present insurmountable difficulties.

But with the increased use of modern mechanical methods of mining, a further complication arose. This was that the proportion of coal 'fines' in available fuel was increasing, which to be gasified successfully and economically, might require the early introduction of one or other of the total gasification projects now under experimental runs. Short term policies now being pursued by the National Coal Board in an effort to hold the present level of production, did not produce a gas coal of high quality. The position was further worsened by the slow rate of progress in providing coal preparation plants, together with a piece-meal programme, designed to modify existing units to cope with the inferior quality coal mined extensively by mechanical means.

Said Mr. Balmer: 'It should be remembered that a 'wet' coal washing unit, although it works efficiently, can only replace the foreign matter in run-of-mine coal by an equally detrimental constituent—moisture. In all probability, the increased use of 'wet' preparation plants will result in further increases in coal price. Because the gas industry has no control over the seams mined, the centres of production, or the method of preparation, its aim should be to receive clean coal at a fair price. The efficiency of the coal washing units affects our coal supplies. Therefore, we should concentrate mainly on this aspect of coal production.'

Referring to the 'sink and float' test, Mr. Balmer explained this was designed to allow the coal substance to float and all the foreign material to sink, and was used to determine the efficiency of a washing unit. He asserted that the replacement of the routine proximate analysis by a 'sink and float' test would be beneficial because: (1) fuel characteristics of all seams are tabulated and furnished by the area scientists of the N.C.B. using modern equipment and techniques; (2) the present system of allocations of coal supplies largely upsets any experience gained in the use of a proximate analysis of a particular fuel; and (3) criticism based only on ash content variation may be countered by an explanation of the coal seams actually mined in any one pit.

Later, Mr. Balmer said the demand for coal would only be reduced by 'the elimination of the wasteful competition among the various sections of the fuel and power industries.'

'A measure of fuel conservation can be practised by our own industry, the effect of which may serve as a lead to the other sections. Existing carbonising plants are, in the main, dependent on steam raised by hand stoked Lancashire boilers. Until electrical power and extensions of waste heat recovery have replaced direct fired boilers throughout our plants, mechanical stokers burning rough breeze will reduce the demand for coal.'

The Coke Oven Managers' Dinner

On Thursday, November 4, the Coke Oven Managers' Association held its annual dinner for 1954 at the Waldorf Hotel in London. As usual there was a very good attendance of members of the Association, which meets in London once a year for its technical and annual general meetings, then rounding off its conference with a dinner. Among the guests were representatives of all sections of the carbonising industries, the contractors to these industries, and also many of the research organisations connected with fuel. Altogether the attendance on this occasion reached an all-time high, and the party was the largest ever catered for by the Waldorf Hotel —significant signs of the growing status of the Association and of its influence on contemporary affairs. In proposing the toast of the Coke Oven Managers' Association, Mr. James Mitchell, C.B.E., suggested that all coal, excepting anthracite, should be carbonised, and that a solid fuel comprising only carbon should be supplied to consumers. He also thought that the by-products obtained from coke ovens should be disposed of for the best possible monetary returns; in this connection he particularly had in mind the gas sold by the coking plants to gas boards and others. The President of the Association, Mr. G. A. Hunter, M.INST.GAS E., replying to Mr. Mitchell, spoke of the continuing and very encouraging growth of the Coke Oven Managers' Association and of the record attendance, to which we have already referred. He mentioned the Yearbook of the Association, and said how useful it was to members, also that the revenue of the Association had increased, and that the affairs of the Association were in very good shape.

The toast of the Guests was proposed by Mr. R. J. Barritt, M.A., Senior Vice-President of the Association, who referred to the value of the yearly meeting of the Association in bringing together, for perhaps the only time in the year, coke oven managers from all parts of the country. An exchange of ideas and information was thus made possible, and the renewal of old friendships could be brought about in the friendly atmosphere of the meetings and the subsequent dinner.

Mr. W. K. Hutchison, C.B.E., M.I.CHEM.E., M.INST.GAS E., Senior Vice-President of the Institution of Gas Engineers and Chairman of the South Eastern Gas Board, replied for the guests with a short but amusing speech. He spoke of the affinity which exists between gas engineers and coke oven managers, especially in view of the fact that a number of gasworks nowadays include coke ovens amongst their carbonising plant. In the matter of coke disposal there was a cordial, if wary, relationship between the coking and gas industries, whilst in regard to the National Coal Board's coal price structure and its fluctuations the two industries were comrades in misfortune. A final word was spoken by Mr. W. N. Wilkinson, Chairman of the Northern Section of the Association, when he proposed the health of the President. In his remarks he drew upon his close friendship with Mr. Hunter over many years for a number of most amusing anecdotes ranking from the time when both Mr. Hunter and he were youths together in the coking industry to the present.

MR. GEOFFREY LLOYD is to visit Stafford on November 19 to inaugurate the catalytic oil plant installed there to produce gas from oil. The first large-scale plant of its kind built in this country, it is an experiment by the West Midlands Gas Board to try to overcome the shortage of gasmaking coal.

MIDLAND JUNIORS VISIT WALKER CROSWELLER

Members of the Midland Junior Gas Association with their hosts at the works of Walker, Crosweller & Co., Ltd., at Cheltenham. Mr. H. J. Reynolds, President of the Association, is in the centre, with Mr. R. F. Walker, Director, who welcomed the party on behalf of the Company.

Some 60 members of the Midland Junior Gas Association spent an enjoyable day visiting the factory of Walker, Crosweller & Co., Ltd., Cheltenham, manufacturers of 'Arkon' instruments and 'Leonard' thermostatic mixing valves. This visit was one of the many items in the Association's programme for this its Jubilee Year.

The visitors were welcomed at the Queen's Hotel by two of the Company's directors, Mr. R. F. Walker and Mr. A. L. Hancock, and entertained to lunch. Mr. Walker, having congratulated the Association on reaching its Golden Jubilee, gave a brief outline of the history of the Company. 'It was in 1920,' he said, 'that my father, Mr. J M. Walker, the present Chairman, and the late Mr. W. W. Crosweller founded a company in the Strand, London, for the purpose of carrying on an import business handling specialised engineering products, among them being Arkon instruments and Leonard thermostatic valves. In those days instrumentation in industry was regarded as something novel and unnecessary but gradually its value came to be recognised by such firms as the Gas Light and Coke Company. The idea caught on because the Arkon instrument was simple, accurate and easily understood by unskilled operators.'

The business grew and soon it was obvious that the London workshop was too small and a larger factory would have to be found. The decision was also taken to manufacture in England both the Arkon instruments and the Leonard valves and so in 1936 it was decided that a new factory should be built in Cheltenham.

As the Company's manufacturing resources have grown in Cheltenham so its connections overseas have grown. The Company now has offices and staff of its own in Zurich, Milan, Montreal, and agencies in every part of the world.

The Leonard valves have been redesigned and under the aegis of Mr. A. L. Hancock the Arkon records have been redesigned and their range considerably extended. The Company had a number of new ideas and designs up its sleeve and during the tour the visitors were shown some of the new projects.

The members of the Association then toured the works, where all stages in the manufacture of Arkon flow recorders and pressure and vacuum instruments were on view. Particularly interesting were the new methods of assembly devised after application by the Company's technical staff, of time and motion study techniques. A demonstration was given of the new system of remote transmission of readings that Walker, Crosweller & Co. have recently developed. This showed the record of the gas consumed in the factory on a recorder placed in the entrance lobby of the office block. Visitors also had the opportunity of making their own working tests of the Leonard thermostatic mixing valves.

MR. H. J. REYNOLDS, President of the Association, afterwards thanked the directors for their hospitality and their wonderfully interesting visit. The firm was to be congratulated on the layout of the light, clean, modern workshops which had greatly impressed them all. 'It is one of the cleanest works I have ever seen in my life,' said Mr. Reynolds who went on to speak of his experiences of Arkon instruments. 'They are absolutely trouble-free,' he said, 'and having seen today the care and skill that goes into them I can well understand why.' Mr. Reynolds was also impressed at the new projects being quietly developed by the Company and stated they were bound to have a great future in the gas industry.

MR. S. C. CRATHORN, Vice-President, also spoke of the efficiency he had seen at Walker, Crosweller's works and was amazed at the volume of work being turned out.

R.S.A. Bi-Centenary Competition

The result of the Bi-Centenary Competition promoted by the Royal Society of Arts for forecasts of practical aspects of life on this earth in the year 2000 A.D. has been announced. The judges appointed by the Council of the Society were unable to make any recommendation for the first prize of £250 or the second of £100, but the Council has made the following awards:

A prize of £50 to Wing Commander T. R. Cave-Browne-Cave (Southampton), for a scheme for rooftop roadways; a prize of £20 to C. E. H. Watson (Walton-on-Thames), for a system of underground roadways for London; £10 to F. R. East (Horbury, near Wakefield), for a paper on synthetic food; £10 to the Rev. C. W. Gibbons (Cambridge), for a paper on education; and £10 to M. B. McEvedy (Manchester), for a paper on microbiological products.

The entries submitted numbered 184, and for the purpose of judging were classified into eight groups, for each of which a panel of experts was appointed.

The first two prizewinners have been invited to read their essays as papers at a meeting at 2.30 p.m. on November 24. The papers, with any following discussion, will be published in the Society's *Journal* almost immediately afterwards.

Parkinson Launch Their 'Live Water' Machine in London

Before an audience consisting of area board chairmen and many sales notabilities of the gas industry, as well as the Press, the Parkinson Stove Co., Ltd., launched their 'Live Water' washing machine at Park Lane House, London, on October 26. Although the appliance has already been demonstrated quite widely in various parts of the country—and we understand that sales have been gratifying—it had not previously had the benefit of a full-scale introduction to the specialised world on which its future success must depend.

If its official début was a long time coming, the splendour of the event provided ample compensation. Here was an example of how to put over an appliance with conviction, charm, good timing, and all the trimmings—including orchids for the ladies.

After a brief introduction from the attractively decorated stage by Mr. H. P. Barker, Managing Director of the Company, Mr. Colin Woodall, London and Home Counties Sales Manager, put over a demonstration which was an object lesson in clarity and conviction. With two washing machines on stage, one with a perspex body and the other a normal production model, he put this literally jet-propelled appliance through its paces. In essence this is a gas-heated, electrically-agitated machine in which the movement of clothes in the washtub is caused entirely by jets of water and not by impellors inside the tub which come into contact with clothes. It is claimed that this new type of agitation, with its gentle action, will give a longer life to clothes.

Its method of operation is comparatively simple. Water is drawn from the base of the washtub through a filter, which is removable for cleaning, and enters a centrifugal pump which drives it under pressure up a pipe situated at the rear of the machine. This pipe enters a manifold where the flow divides into two branches each of which enters the washtub to feed a jet. The jets are located at the upper part of the case of the washtub and act also as supports for the wringer. They are well streamlined to avoid clothes catching them.

Left to right: Mr. Michael Milne-Watson, Chairman of North Thames Gas Board, Mr. R. J. Rogers, Chairman of the Parkinson Stove Co., Ltd., Mr. E. C. Woodall, Director of Parkinson & Cowan, Ltd., Mr. H. P. Barker, Managing Director of Parkinson & Cowan, Ltd., and Mr. H. J. H. Jones, Deputy Chairman of the Gas Council. At the rear can be seen Mr. L. W. Andrew, Manager of Watson House, and Mr. S. G. Aberdein, Commercial Manager of North Thames Gas Board.

The water leaves the jets in a downward and rearward direction and impinges on the rear wall of the washtub which is curved forwards, and this imparts a rotary motion to the water in the tub. Because this rotary impulse is given to the water-clothes mass over only a part of its periphery, there is a tendency for the clothes mass to open out near the jets and come together again at the front of the tub. In addition the uneven velocity distribution ensures that in some parts the water is moving faster than the clothes, and in others clothes are being drawn through the water. These two factors give the washing action. The time of agitation for normally soiled cottons is five minutes. The full load capacity of the machine is 4½-5 lb. of clothes (dry weight).

At the demonstration Mr. Woodall used a double blanket, and there could be litle doubt that women journalists were impressed by the ease with which it was handled, particularly during the wringing operation when the outer lid of the appliance was inverted and hooked on to form a discharging platform which greatly assisted by taking the full weight of the article as it came through the wringer.

It is generally conceded that the time to sell gas-heated home laundry appliances is *now* before the whole of the washing machine load goes to electricity, and in this urgent campaign the Parkinson machine will no doubt play a valuable part. From this point of view the demonstration we saw in London was a most encouraging one.

Following the demonstration, the special perspex model of the 'Live Water' washing machine was the centre of interest. Mrs. J. M. Smith, washing machine adviser to The Parkinson Stove Company, Ltd., is shown demonstrating a point of operation. On the right are Mr. E. V. Quickenden, Sales Manager of the Southern Gas Board (Bournemouth Undertaking), and Mrs. Mair Jones, Chief Home Service Adviser of the South Eastern Gas Board.

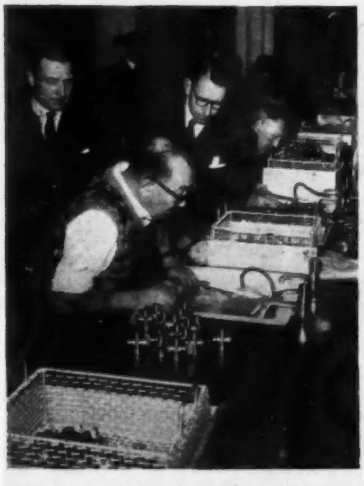
Opening of

North Thames Central Stores

The new central stores of the North Thames Gas Board at Great West Road, Brentford, the subject of a feature article in the 'JOURNAL' last week (pp. 322-32) were informally opened on Novembe 2, when parties of members of the Purchasing Officers' Association, the Institute of Public Supply Officers, and representatives of the technical and lay Press made an interesting and detailed tour of inspection of the premises. At the end of the long trek the visitors assembled for buffet tea in the canteen, where they met Mr. Michael Milne-Watson, Chairman of the Board; Mr. F. M. Birks, Deputy Chairman; Mr. Brian Wood, Secretary; Sir Harold Smith, Chairman of the Gas Council; Mr. F. G. Brewer, Secretary of the Gas Council, and a number of other leading gas personalities.

MR. MILNE-WATSON, in welcoming the visitors, referred particularly to the presence of the Chairman of the Gas Council, whose interest in what the Board did was always appreciated. He also mentioned Mr. F. J. White, President of the Purchasing Officers' Association, and expressed to him the Board's appreciation of the work done by that Association in enabling all engaged in buying to share and so benefit by common experience. It was a matter of pride to the Board that Mr. H. C. Exell, the Board's Controller of Stores, was Vice-Chairman of the P.O.A., and that Mr. J. M. Grammer, the Board's Stores Buyer, was Chairman this year of the London branch of the Association. The guests included officers, Council members and many members of the Association who, as a body, represented most of the industries of this country. He also welcomed Mr. J. Tyler, President of the Institute of Public Supply Officers.

The North Thames Board, continued Mr. Milne-Watson, were the successors of the Gas Light and Coke Company which before the war had a central purchasing and storekeeping organisation with its headquarters in the old central stores at Nine Elms. With the war came decentralisation of actual storekeeping, since it was deemed inadvisable to have all the eggs in one basket. The central 'basket' was destroyed in an air raid in 1941, and the end of the war found the stores organisation displaced and homeless, like others elsewhere. The Company was fortunate in acquiring the building at Great West Road, which had proved so suitable for conversion to a central stores, with good communication to all parts of the area of the North Thames Gas Board which, on nationalisation, took over the Company's assets.

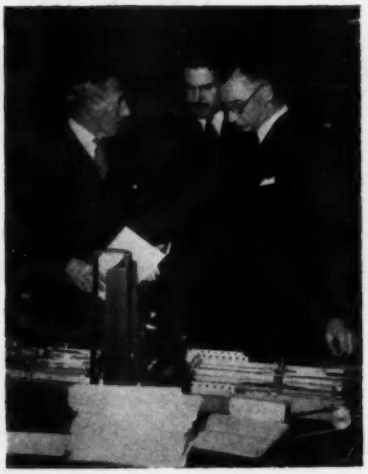


Gas fittings being tested under pressure at the new central stores.

Mr. S. G. Aberdein, Commercial Manager of the North Thames Gas Board (right) and Mr. A. J. Cross, Stores Superintendent, show Mr. Eric J. Lynde, Quantity Surveyor (left) how defects in gas fittings are detected.

Much thought and planning went to produce the stores as the visitors had seen them that day, and many departments of the Board were involved. For the work of reconstruction the Board was grateful to Mr. John Batty, the Architect, and Mr. Eric Lynde, the Quantity Surveyor, both of whom were present, and to the contractors, W. J. Cearns, Ltd., who were represented by Mr. L. C. Cearns, Managing Director, and Mr. C. Jones, General Foreman. The Board attached much importance to proper storekeeping and purchasing as one aspect of its responsibility to the consumer in that they made for the cheapest and most efficient service. A vital part of the establishment was the testing department, which ensured the maintenance of the reliability and safety of fittings in the service of the consumer.

No less important was the provision of good working conditions for employees and for places where they could refresh themselves in pleasant surroundings and at reasonable cost. Representatives of the employees were with them



Sir Harold Smith, Chairman of the Gas Council, with Mr. Michael Milne-Watson, Chairman of the North Thames Gas Board, and Mr. H. C. Exell, Controller of Stores, in the printing department.

in the persons of the members of the two joint consultative committees concerned with those who worked in the central stores.

MR. F. J. WHITE voiced the thanks of the members of his Association and all the other visitors for the Board's hospitality and mentioned that Lord Verulam, a member of the Board, was a Patron of the Purchasing Officers' Association. The visitors represented many industrial undertakings covering many different fields in which stores management was a vital thing, and he could say that he had never known an organisation where there was greater emphasis on the value of well-planned and well-managed central stores. Mr. Exell had been a wizard of persuasion and determination in getting such an establishment going, and he had also done very valuable work in the promotion of a scheme for the training of young buyers. Mr. White closed with a touch of humour by expressing disappointment at having failed to find any piglet warmers on the premises. (The Board's annual report, in reviewing work on the industrial uses of gas, had mentioned that 'an unusual appliance tested was a piglet warmer').

SIR HAROLD SMITH said he welcomed this his first opportunity of meeting the members of the Purchasing Officers' Association who, he suggested, were ganging up against the poor sellers, but he offered a word of caution that someday the sellers might gang up against the purchasers. It was refreshing, after visiting so many gas manufacturing stations, to visit a fine central stores where the importance of testing was no less recognised than on the works. With gas going into some 12 mill. homes and thus serving about 50 mill. individuals it was almost inevitable that some people would handle it with less care than was desirable, and it was essential therefore that all fittings should pass the highest possible tests. Like fire and water and electricity, gas was a bad master but a good servant.

GAS IN TOY MANUFACTURE

The Chairman of the Gas Council, Sir Harold Smith, with the Deputy Chairman of the South Eastern Gas Board, Mr. R. S. Johnson, on left, and the Works Manager of Lines Bros., Ltd., Mr. R. V. Matthews, right, examine a Tri-ang toy during the recent press facility visit to the Lines Bros. factory at Merton, S.W.19, organised by the Gas Council in conjunction with the South Eastern Gas Board. Mr. Johnson had taken the chair at the lunch given by the South Eastern Gas Board before the visit.

Colour Film of Pipe Bridge

Crowley Russell & Co., Ltd., are showing in their offices at 131, Victoria Street, London, S.W.1, during the week of the Public Works and Municipal Services Congress, a colour film of a recently constructed pipe bridge across the River Trent. The bridge was constructed in pre-stressed concrete and put across the 250 ft. span of the river in one piece at Whitsuntide so that the navigable channel should be closed for the minimum period. The Congress is from November 15 to 20, and during that period anybody wishing to see this film will be welcomed at showings at 10.30 a.m. or 4 p.m. or by appointment.

A Battery of Coke Ovens, together with by-product recovery plant, has been put into commission at the Sindri (Italy) fertiliser plant. The plant is designed to produce 200,000 tons of coke per annum, which will be sufficient to meet the factory's internal requirements. The by-products will be tar, ammonia, and benzole.

Exceptionally Severe corrosion conditions resulting from the 'summer' of 1954 are believed to be the reason for an unprecedented demand for anti-corrosion pipe wrappings. Winn & Coales, Ltd., manufacturers of Denso tapes and compounds, report that this has made it necessary to build an extension to their main factory which will enable a 50% increase in production.

Rotherhithe Contract

The Power-Gas Corporation, Ltd., has received instructions from the South Eastern Gas Board for a carburetted water gas installation for its Rotherhithe works. The installation will comprise two units each having a daily productive capacity of 6 mill. cu.ft. when using coke in the generator and heavy oil for enrichment. The generators are of the dry base type and incorporate the reverse flow carburetting system, which is particularly suitable for the use of heavy oil. The cyclic coke feeds have a wheeled under-carriage for simple removal. The final hydraulic connections being of the flexible type enable the feeders to be operated under test conditions away from the generator.

Automatic operation embodies the use of oil as a hydraulic medium operating at a pressure of up to 1,000 lb. per sq. in. and incorporating Lockheed equipment. Other features include elevated cone based washbox and special three-way gas change over valve, to replace the separate up-run and back-run valves. Gas cooling will be carried out in a direct contact washer cooler with a cooling tower and recirculating system.

Woolwich Borough Council is to be asked to approve a scheme making it obligatory for tenants of a new housing estate to burn coke or other smokeless fuel.

EAST MIDLANDS SALES CONFERENCE

The Area Sales and Service Conference of the East Midlands Gas Board, held at Leicester on November 4, is the subject of editorial comment on p. 386 of this issue. This photograph, taken at the commencement of the conference, shows, from left to right, Mr. H. R. Hart, Commercial Manager, East Midlands Gas Board; Mr. A. Gwynne Davies, Secretary, East Midlands Gas Board; Mr. Frank Sadgrove, Batchelors' Peas, Ltd.; Mr. Sydney Smith, Chairman, East Midlands Gas Board; Miss E. P. Corkill, Home Service Adviser, Northampton Group; Mr. E. H. Harman, Deputy Chairman, East Midlands Gas Board; Mr. E. J. Rainey, Lamson Paragon Supply Co., Ltd.

Third North Eastern Staff Conference

'Stocktaking' at Harrogate

Board members, headquarters officials, and senior members of the staff from all parts of the area 'took stock' of the first five years of nationalisation at the third biennial staff conference of the North Eastern Gas Board at Harrogate on October 27-29. Four panels met on the Wednesday afternoon and their findings were reported at a plenary session on the Thursday morning, at which also Dr. R. S. Edwards, Chairman of the Board, delivered an address of outstanding interest on the present position and future prospects of the Board. Three further panels met on the Thursday afternoon, and their findings were similarly reported at a plenary session on the Friday morning, when the principal speaker was Sir John Maud, Permanent Secretary of the Ministry of Fuel and Power. The business concluded with a review of the conference by Mr. G. E. Currier, Deputy Chairman of the Board.

Other items in a programme which was unanimously voted to have been inspiring and enjoyable were a film show on the Wednesday afternoon, followed by a civic reception and dance at which the visitors were welcomed by Councillor A. V. Milton, a former Mayor of Harrogate (deputising for the Mayor and Deputy Mayor, who were otherwise engaged in connection with the Royal Visit to the North East). The ladies visited Harewood House on the Thursday afternoon and took tea with Mrs. R. S. Edwards and Mrs. G. E. Currier, and in the evening members of the Board and their guests attended a performance of the play 'This was a Woman,' in which Sonia Dresdel made a personal appearance at the Harrogate Opera House.

The discussion panels on the Wednesday dealt with 'Domestic Gas Sales, Past, Present, and Future' (Speaker, Norman Hudson, Chief Commercial Officer; Chairman, Alderman H. Sutcliffe, Chairman, Leeds Local Committee, Gas Consultative Council). 'Research and Consumer Service—Their Contribution to Industrial Gas Sales' (Speaker, A. Higgs, Industrial Gas Engineer; Chairman, W. R. Todd, Part-time Board Member). 'Coke—The Challenge' (Speaker, D. G. Wilson, Coke Officer; Chairman, Brigadier K. Hargreaves, Managing Director, Hargreaves (Leeds), Ltd.). 'Joint Consultation' (Speaker, C. L. Davies, Industrial Relations Officer; Chairman, J. W. Fisher, District Organiser, National Union of General and Municipal Workers).

The First Five Years

THE CHAIRMAN addressed the conference on 'The First Five Years.' By way of introduction he referred to the 8,500 employees of the Board whom the staff members and members of the consultative committees represented. They served some 850,000 consumers all over Yorkshire, and their success as a Board would be measured in the end by how well the 8,500 people did their job and how the 850,000 consumers reacted to their efforts. At vesting day, owing to war conditions mainly, the Board started, in parts of the area but not in all, in a state of acute shortage of supply. After five years they were now in a position to say that they had a reasonable availability of gas for all likely demands almost entirely throughout the area. Their main new manufacturing programme had almost reached conclusion at the present stage of the Board's development. Their biggest task had been to build the new gasworks at Tingley. Half of that had now been finished for some time, and the three-quarter part of it was due to make gas early in the new year. The final quarter would be in operation before next winter, raising the output of the works to 14 mill. cu.ft. of coal gas per day.

Change in Emphasis

There had been a change in emphasis, in the point of production. They started off with 72 manufacturing stations with a total daily capacity of 104¼ mill. cu.ft. At the end of the first five years' programme, with the new facilities provided, they found themselves with 55 stations capable of producing 148 mill. cu.ft. of gas per day, an increase of some 42½%. Concentration of production in large units meant that they must create a trunk system of gas mains to take gas to places which had previously been producing gas by themselves, and the Board had built up a new system of trunk mains which they called for the sake of convenience their extended West Yorkshire Gas Grid. They were fortunate in that they inherited the West Yorkshire Gas Grid on vesting day. That work was not so far advanced as the manufacturing programme but they had seen a good deal of the work completed during the recent (so-called) summer months.

Parallel with work on trunk mains had been the great deal of attention given to the improvement in the supply to individual consumers. There was no doubt that five years ago the Board was by no means well placed with regard to its distribution system. He had referred two years ago to the work then already completed. Today the majority of the black spots had been dealt with, and pressure conditions and quality conditions of gas supply were now good and adequate for the vast majority of consumers. The number of complaints had greatly decreased since they first took over. The Board had upheld its duty of developing and maintaining an efficient, co-ordinated, and economical system of gas supply. In the gas industry in this country they did more than supply gas. They also gave individual service to the consumers inside their houses, and they supplied the appliances.

On vesting day the Board inherited 92 so-called showrooms and service centres. Fourteen of them were merely offices or spare rooms at gasworks, in nearly all cases remote from the normal shopping centres of the towns. They felt as a Board that if they were going to set out to sell gas appliances they must have adequate and modern showrooms. It was easy to take a decision of that sort but it had proved to be by no means easy to put it into being, for a whole host of reasons, of which a good many of them were well aware, the principal being the restriction on building work of all types in the immediate post-war years and indeed until very recently. But eight of the 14 had been either completely modernised or replaced by entirely new premises in the shopping areas. That number was being quite quickly increased. In the case of reasonably situated showrooms 45 had been improved by the installation of electric light. They had redecorated those showrooms in a style which, though perhaps not so striking and modern as they would like, had resulted in a vast improvement in their appeal to the public. Side by side with that they had a vastly improved supply of appliances of modern design. He had always been interested in design, and he thought it was a factor the importance of which was very often overlooked. The gas industry in these last five years, through the manufacturers working in co-operation with Watson House in London and with the help of much good advice from the chief commercial officers of the boards, had done a grand job of work in re-styling as well as improving the efficiency of gas appliances.

Removal of Restrictions

They had to tell the story of gas and coke to 850,000 consumers. They had passed through a period in which the normal media and methods by which any trading concern or any public utility could put over its stories had been subject to severe restrictions, which were now happily removed. They were grateful to the Ministry for the removal of those restrictions, but they would still keep a watchful eye on the expenditure of money in that direction. Last but not least, half way through the first five years the Hire Purchase Restrictions Order was imposed. That was a deadly blow indeed, and not until last August were those restrictions removed, and they had found that they had got an immediate uplift in the sales of appliances as a consequence of their removal. Gas appliances were not things that were subject to casual purchase. They were items that were purchased after a period of deliberation and by deliberate definite decision on the part of the ordinary householder. They lasted for a long time, and therefore they were eminently suitable for sales by hire purchase. It was a matter for gratifica-

tion that sales of appliances were now running at something over 40% above last year.

Industrial demand had increased; commercial demand was up and they were endeavouring to find further commercial applications. The domestic demand, in total, was down. That was not because the number of consumers had fallen. They had lost in fact practically no consumers, and they had gained fresh ones, but consumption per consumer had gone down. The slight decrease was in large measure due to the efficiency of modern appliances. In contributing thereby to the economics of the home they found themselves in a financial strait jacket. There was another factor—the continued change in social habits, smaller families, less eating at home, and more communal eating in messrooms, canteens, and other places. The introduction of the Board's tariff was a step in the right direction. They had eliminated 400 different tariffs and replaced them by a single all-purpose tariff—a tariff they had evolved by virture of the Gas Act itself.

The Board ended the first five years with a reserve fund of £200,000 and had carried forward £87,000.

Industrial Relations

There were many other duties under the Gas Act that the Board had to discharge. A very important one concerned their relationships with their employees. The first five years had seen a substantial disappearance of some of the hard physical and dirty jobs of the industry and a definite up-grading in the number of jobs demanding higher qualities of brain. He thought it was the duty of every industry to try to improve the standards of education and to increase the technical knowledge and intelligence of their people, and he thought the Board could claim to have done a very good job of work. That was one of his answers to those who said they were a set of bureaucrats and suggested that their progress in administration did not mean a thing.

They were getting rid of the hard physical labour and replacing it with labour appropriate to the mid-twentieth century. He claimed that they had done more in these last five years than in any comparable period. It was clear that there was a great deal more still to be done in education and training. They had lately introduced what was going to be, through their Chief Medical Officer, a first class medical service which was going to help immensely on the health side. They had made a good start in the work of consultation and the dissemination of information from the top management to those whose task it was to carry out the daily work of the Board, but here again there was a lot more to be done. Another important side was their negotiations with the trade unions under organised industrial negotiating machinery. It was fair to say that they had gone through five and a half years without any real quarrel, but they had occasionally had their differences of opinion.

The future pattern of the production and distribution of gas for the next decade had now been pretty well settled. The greater part of their new manufacturing facilities were available. Physical integration was rapidly taking place, and the next few years would see it almost entirely in operation. They had put quality and pressure right for almost the entire area and they were rapidly improving their consumer service facilities. All this had been achieved and the Board's finances had been kept on a sound basis without increasing the price of gas to a greater extent than the increases that had taken place in their raw materials and the rates of pay of the staff.

Grounds for Optimism

They had good grounds for satisfaction at the work they had accomplished, and for sober optimism regarding the future. Nevertheless they had undoubtedly, of all the nationalised industries, one of the toughest assignments, and he would like on behalf of the Board to pay a tribute to their staff and to their other friends. They could not have accomplished what had been done were it not for the devoted and loyal service of the staff at all levels. It had been a tremendous effort. The spending of £13¼ mill. alone was a colossal effort for a staff of 8,500 people. One of the greatest things the nationalised gas industry inherited was a tradition of loyalty and service from all who served in the industry. The Board had been proud to present awards and gifts to a surprisingly large number of people who had completed 30, 40, and in many cases 50 years of service to the gas industry in Yorkshire. They were grateful for the way they had backed up the Board in a period of difficulty, and he would like to record thanks to all of them.

It was difficult at times for the Chairman of the Board to know what they were thinking. They were recognised as a happy Board, and he believed that unless they were a happy team they would never be successful. If they could keep happy they would keep their good relations with the consultative committees and the trade unions whose job it was to see that the men received a fair day's pay for a fair day's work. Their good relations were a great encouragement for the years that lay ahead.

MR. G. E. CURRIER, Deputy Chairman, proposed, and MR. A. MCDONALD, Member of the Board, seconded, a vote of thanks to the Chairman.

The three discussion panels on the Thursday afternoon considered 'Economy and Efficiency in Gas Production' (Speaker, F. C. Barker, Chairman, C. A. Newham), 'Trade Union Approach to Industrial Relations' (Speaker. H. Matthews, Chairman, G. Hood), and 'Management Accounting and Budgetary Control' (Speaker, F. W. Allum, Chairman, R. Walton). On the Friday morning the conference heard the Chairman of these panels give their views on the subjects discussed. Dr. R. S. Edwards, the Chairman of the Board, presided. Introducing Sir John Maud, he said he thought the Board was very fortunate that Sir John had managed to spare the time to come from London to give them the benefit of an address.

SIR JOHN MAUD, Permanent Secretary of the Ministry of Fuel and Power, said they were celebrating the end of their teething troubles, the end of the first five years, and he would like to congratulate the Board on the splendid start they had made. It would be unrealistic not to note that the end of the first successful five years was not necessarily the beginning of a still more successful next five years. All the fuel and power industries had been on a 'seller's market,' but during the next five years there would be something more of a 'buyer's market' so far as fuel and power was concerned, and a decline in domestic sales was something of which they would have to take account. There had recently been mentioned a slogan 'Invest in Success' and it was worth noting that so far as the nationalised industries were concerned—gas, electricity, and coal, etc.—the Prime Minister had himself in the House recently in effect said that his party—and he thought that he could assume that the other party had done so—had invested in the success of the gas industry.

Sir John referred to the fact that he had previously served the Ministry of Education and he emphasised that education authbrities while enjoying freedom of approach had less power and less autonomy than had the gas boards today. They had opportunities with this freedom and the disadvantage that their main competitors were left free and it was not possible for them to do more than ask the Minister to try to see fair play between competitors and consumers.

Government Policy

The whole policy of the Government was that the great buoyancy of the economic system, leading to increased exports payments and balance of production, should be encouraged by expansion in the fuel resources of the country. They were in a position in which they could look to progress and the promotion of sales instead of feeling that they had to hold back and not allow anybody to use their product who could do without it. These were some of the reasons why, as he looked at the future of the gas industry, he had chosen the slogan: 'Death or Glory.' The area boards were unique in the present pattern of nationalisation. There was the series of regional boards with autonomy and the machinery of the Gas Council which could help all. He spoke of the advantages of the size of the area boards over the former gas company units.

They had an almost unmatched tradition in the gas industry of good labour relations and sense of team spirit between management and employees. The public relations work of the gas industry had been done well.

When all was said and done there was one respect in which they had most to gain and that was in proving the prophets of doom once more to be liars by finding ways to glory which at the moment they could only dimly sense—creative,

inventive work which in ten or 15 years' time would be a large reason why the gas industry would have been found to have chosen glory. 'Invest in Invention' was the best exhortation he could give them.

Tribute to Mr. J. C. Gardner

MR. G. E. CURRIER, Deputy Chairman, proposed a vote of thanks to Sir John Maud, and then proceeded to review the conference, the purpose of which, he said, was two-fold. The success of the Conference was largely due to Mr. Gardner and his staff, who had done a really first-class job of work. Mr. Gardner was probably the only chief official who had not presented a paper but if he could go on presenting such first-class organisation he should be excused from giving papers. Mr. Currier mentioned also a 'noble band of young ladies' who, he said, had done a tremendous amount of work. They were secretaries and private secretaries. He mentioned by name Mrs. Spragg, Miss Fountain, Miss Cudworth, Miss Walker, and Miss Butterfield. Last but by no means least he mentioned Mr. Cairns.

Mr. Currier then turned to the papers and the masterly address given by the Chairman the previous day, reviewing the first five years of the Board. Turning to industrial relations, he thanked Mr. Hood for the bouquet he handed in by saying that the Board practised consultation with its employees. There had always been a happy relationship in the gas industry and he thought it related back to 1922 when the first Joint Industrial Council in this country was established in the gas industry. Their relationship with trade unionists from then on had been of the very best.

Mr. Matthews had given a paper on industrial relations. He, Mr. Currier, had known Mr. Matthews for many years and soon found he was an idealist, and it always used to strike him that he used to rate human nature rather higher than we deserved. The trade unions had secured many rights and benefits for their members and Mr. Matthews pointed out that there was no magic formula for producing the wealth on which these benefits depended. They carried responsibilities also. One of the responsibilities was the corollary of the phrase used by the Chairman: 'A fair day's work for a fair day's pay.' Mr. Hood had presented to them in a very able way the assurance that there should be no attempt to usurp the function of management.

Joint Consultation

Turning to Mr. Fisher's summing up on joint consultation Mr. Currier said it seemed that consultation in the North Eastern area was generally regarded as satisfactory. Budgetary control was a new development in the Board and in industry generally. The system was being built up slowly, beginning with basic costs and revenue from production. The panel explored the advantages of including costs of main laying, appliance installations and motor transport. Budgetary control should be regarded as not more than a tool to check on the effectiveness of management. The standards used should not be regarded as optimum. No system of accountancy control could be regarded as a substitute for efficient technical supervision. Turning to Mr. Barker's paper, Mr. Currier said much had been done on the manufacturing side and the distribution of gas by integration.

Improved Efficiency

Efficiency of production had risen from 74% to 77.5% over five years. The Board had approved the installation of a new purification process which was a German process and which would be the first in this country. It would make the operation of purifiers far better for the employees. With regard to further economies the stress was on the operation of producers to see that they worked efficiently and without waste. On coke Mr. Wilson had presented a good paper dealing with the Board's policy. A group coke officer's main function was to maintain existing markets and develop new markets. With the new marketing scheme they were hoping that a better relationship would accrue. They had started on the right note by having Brigadier Hargreaves there as Chairman, because he was one of the most important coal and coke merchants in the area.

Mr. Currier turned to the panel which dealt with industrial gas, and then to domestic gas sales, which he thought was the most important subject of the conference. If they did not sell gas to the domestic consumer, they could not exist. Their sales per consumer had been falling every year. It was everyone's responsibility to contribute to the arresting of this decline. Were they, he asked, satisfied with the consumption per domestic consumer in that area? Were they content that the North Eastern Gas Board should be at the foot of the table with a lower consumption per domestic consumer than any other Board? If they were, the Board was not, and something had to be done.

A Call to Action

In conclusion Mr. Currier said he trusted that the work of the conference would produce action as a fulfilment of their hopes for the Board.

Dr. Edwards, winding up the conference, said he hoped and believed that they would get something of permanent value from it. Board members had had quite a number of interesting points brought out on the lines of development. Points which had arisen had been noted and would be considered. It did not follow that they would be acted upon, but he was quite sure a number of developments would come. He hoped they had learned something of the functions of the Board as a whole which they would apply in their daily work on behalf of the Board. They had all gained something from meeting each other.

Our report of the reviews presented by the chairmen of the seven discussion panels at the two plenary meetings—four on the Thursday and three on the Friday—is held over for a later issue.

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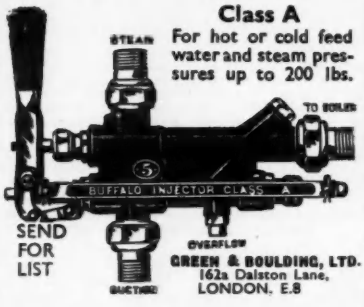

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Applicants should have good Distribution experience and organising ability and must be first class Gas Fitters. Possession of the Full Technological Certificate in Gas Fitting will be regarded as an additional qualification.

Ability to drive a motor vehicle will be an advantage.

Salary in accordance with Grade A.P.T. III, Provincial "B" commencing within the range of £445 to £490 per annum.

The successful candidate will be required to pass a medical examination and subscribe to the Board's Superannuation Scheme.

Applications stating age and experience together with the names of two referees, to be forwarded to the undersigned by November 22, 1954.

A. L. THOMAS, A.M.INST. GAS E.,
Engineer and Manager.

Gas Offices,
12, Picton Place,
Haverfordwest.

NORTH WESTERN GAS BOARD

APPLICATIONS are invited for the following pensionable appointments:—

WIRRAL GROUP
GROUP DISTRIBUTION DEPARTMENT
TECHNICAL ASSISTANT (DISTRIBUTION)
(Salary within Grade A.P.T. VIII—£625/£705 per annum)

The successful applicant will be required to carry out all types of technical work in connection with gas distribution.

Applicants should preferably hold the Higher Grade Certificate in Gas Engineering (Supply) of the Institution of Gas Engineers or an equivalent qualification, and should have experience of gas distribution practice.

DRAUGHTSMAN
(Salary within Grade A.P.T. VII—£585/665 per annum)

Applicants should have knowledge of the design and layout of distribution plant including boosters and governors, and plan records of mains systems. A knowledge of surveying and levelling will be an advantage.

Detailed applications, giving the names of two referees, should reach the General Manager, N.W.G.B. (Wirral Group), Hind Street, Birkenhead, within fourteen days.

EAST LANCASHIRE GROUP
DISTRICT FITTINGS INSPECTOR—
CLITHEROE DISTRICT
(Salary within Grade A.P.T. IV—£335/525 per annum)

A house is available if required at a reasonable rent. Candidates should hold a qualification in Gas Engineering (Supply) and/or in gas fitting and have had good experience in the duties required.

The successful applicant will be responsible for the inspection and supervision of the installation of appliances in consumers' premises. He should be capable of preparing estimates and have a knowledge of salesmanship.

Detailed applications, giving the names of two referees should reach the General Manager, N.W.G.B. (East Lancashire Group), Gas Offices, Cardwell Place, Blackburn, within fourteen days.

(*Classified advertisements continued on page* 414)

APPOINTMENTS VACANT (ctd.)

NORTH THAMES GAS BOARD

A DRAUGHTSMAN is required at Slough Gas-works. Applicants should be experienced in the maintenance of gas manufacturing and ancillary plant and be conversant with the design of steel structures and the layout of buildings.

Starting salary, depending on age and qualifications, will be within the range £520-£725 per annum. The successful candidate will be required to join the Staff Pension Scheme.

Applications, stating age and giving full details of qualifications and experience, should be sent to the Staff Controller, North Thames Gas Board, 30, Kensington Church Street, W.8, quoting reference 666/192.

JUNIOR DRAUGHTSMEN required by North Thames Gas Board at Poplar Gasworks, E.14, and Lea Bridge Gasworks, E.10. Applicants should preferably have had some experience in the maintenance of gas plant and be conversant with the design of steel structures and layout of buildings.

Starting salaries, depending on age and qualifications, will be within the range £285-£555 per annum. The successful candidates will be required to join the Staff Pension Scheme.

Applications, stating age and giving full details of qualifications and experience, should be sent to the Staff Controller, North Thames Gas Board, 30, Kensington Church Street, W.8, quoting reference 666/193.

WEST MIDLANDS GAS BOARD

BIRMINGHAM DISTRICT
SHIFT SUPERVISOR—
SWAN VILLAGE WORKS

CANDIDATES must be fully qualified to take control of the whole of the Works during periods when normal day Technical Staff is absent. They should have had experience of carbonising in Continuous Vertical Retorts, Gas Purification, Water Gas :Manufacture and Steam Production, together with the ability to control labour on a large Gas Works.

The salary will be within Grade VIII (£625-£705 per annum) of the National Salary Scales for Gas Staffs.

The post is pensionable and the successful candidate may be required to pass a medical examination.

Applications, stating age, personal details, particulars of training, experience and qualifications, together with the names of two referees, should be addressed to Mr. J. E. Wakeford, Divisional General Manager, West Midlands Gas Board, Birmingham and District Division, Gas Offices, Edmund Street, Birmingham, 3, to reach him within fifteen days of the appearance of this advertisement.

F. H. CURETON,
Secretary to the Board.

EASTERN GAS BOARD

TOTTENHAM DIVISION
JUNIOR TECHNICAL ASSISTANT—
PONDERS END WORKS

APPLICATIONS are invited for the position of JUNIOR TECHNICAL ASSISTANT at Ponders End Works.

Candidates should be over the age of 25 years and should have had a good experience of Carbonisation.

The salary will be within Grade A.P.T. IV (Met.) of the National Salary Scales for Gas Staffs.

The person appointed may be required to pass a Medical Examination and, unless already subject to a Pension Scheme by virtue of the Gas (Pension Rights) Regulations 1950, will be required, if eligible, to join the Board's Staff Pension Scheme within six months from taking up the appointment.

Applications, stating age and giving full particulars of experience and qualifications should be addressed to the Divisional Personnel Manager, Woodall House, 658 Lordship Lane, London, N.22, to arrive not later than Saturday, November 20, 1954.

SOUTHERN GAS BOARD

COMMERCIAL MANAGER

APPLICATIONS are invited for the appointment of COMMERCIAL MANAGER to the Board at a commencing salary in the region of £2,500, according to qualifications and experience.

Applicants must have had extensive marketing experience and be capable of organising sales promotion campaigns for the development of the use of gas and coke for domestic, commercial and industrial purposes.

The successful candidate will be required to pass a medical examination and, unless already subject to a pension Scheme by virtue of the Gas (Pension Rights) Regulations, 1950, will be required to join the Board's Staff Pension Scheme.

Applications stating age, education, qualifications, training, experience, present appointment and salary, together with a one-page summary of these particulars, should be sent in an envelope marked "Commercial Manager" to the Secretary, Southern Gas Board, 164, Above Bar, Southampton, to reach him not later than November 30, 1954.

SOUTH EASTERN GAS BOARD

DIVISIONAL INDUSTRIAL REPRESENTATIVE
METROPOLITAN DIVISION

THE successful applicant will be located at 709 Old Kent Road, S.E.15, and will normally operate within the Metropolitan Division of the Board.

Applicants must have a wide experience in the construction and installation of industrial and commercial gas equipment and a sound knowledge of industrial heat treatment processes and modern production techniques.

Applicants should possess technical qualifications of not less than Higher National Certificate Standard and Corporate Membership of a Professional Engineering Institution is desirable.

The salary will be not less than £900 per annum, according to qualifications and experience.

Applications giving full details of age, experience, qualifications, present position, etc., and quoting reference V10/463, should reach the undersigned not later than fourteen days after the publication of this notice.

R. J. MCCRAE,
Personnel Manager.

Katharine Street,
Croydon.

SOUTH EASTERN GAS BOARD

HOME SERVICE ADVISER,
KENT SUBURBAN DIVISION

SUCCESSFUL applicant will be required to conduct demonstrations, give lectures and advise consumers in their own homes in the use and care of gas equipment.

Preference will be given to applications from persons who :—

(a) have had not less than three years' experience in demonstrating in Gas Industry ; and
(b) have undergone training for two years at a recognised training college of Domestic Arts ; and
(c) hold a diploma in cookery, housewifery and laundry work.

Salary within Grade VI (Met. Area) (Female), £448-£512 per annum.

Applications will be considered from persons who have not the qualifications and experience indicated, but in such circumstances the commencing salary will be within a lower grade than VI.

Applications in writing, quoting reference V10/466 and giving full details, should reach the undersigned not later than fourteen days after the publication of this notice.

R. J. MCCRAE,
Personnel Manager.

Katharine Street,
Croydon.

SHIFT Charge Hand required for Coal Carbon-ization Plant. Gas Works or Coke O en exp r enc desired. Applications in writing to the Labour Office Courtaulds Ltd., Trafford Park, Manchester, 17.

ASSISTANT CHEMIST (aged 20-30) required fo testing and development work on domestic ga appliances. Salary will be in accordance with experienc Apply stating qualifications and salary required to— General Gas Appliances Ltd., Corporation Road Audenshaw, Manchester.

EAST MIDLANDS GAS BOARD

LEICESTER AND NORTHANTS DIVISION
APPOINTMENT OF
HOME SERVICE ADVISORY STAFF

APPLICATIONS are invited for vacancies which ha e arisen for HOME SERVICE ADVISORY STAFF in the NORTHAMPTON and WELLINGBOROUGH areas, as follows :—

(A) HOME SERVICE ADVISERS.

Salary range £308/464 per annum. Candidates must be capable of working independently and be in possession of a recognised Diploma in Cookery and/or Domestic Science. They should be proficient in the practical demonstration of gas cooking, laundering and other appliances, and be able to advise consumers on all domestic problems involving the use of gas in the home.

(B) HOME SERVICE ADVISER TRAINEES.

Salary range £204/308 per annum. Candidates should have spent some two or three years at a Domestic Science Training College or similar institution and possess a recognised diploma or qualifications in domestic science. After a period of training to enable her to acquire a knowledge of the Gas Industry and gas appliances the successful applicant will be eligible for transfer to the status and salary of a Home Service Adviser, as above.

The posts are pensionable and the persons appointed may be required to pass a medical examination.

Applications stating age, experience and present position, and giving full particulars of training and qualifications, together with the names of two referees should reach the undersigned not later than Wednesday November 17, 1954.

Applicants should state whether they wish to be considered for employment in the Northampton area and/or the Wellingborough area.

H. B. TAYLOR,
Divisional General Manager.

Gas Offices,
Millstone Lane,
Leicester.
November 5, 1954.

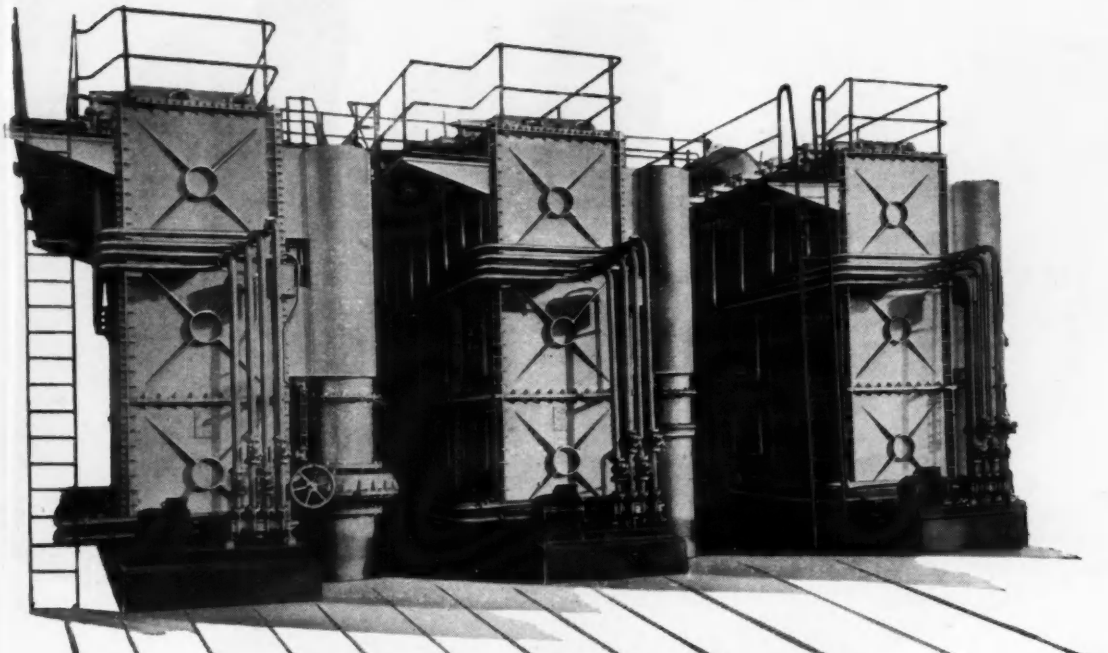
PLANT, &c., WANTED

WANTED

ALWAYS BUYING Scrap Mercury and all grades precious and non-ferrous scrap metals, any form keenest prices. Let us quote. **Belgrave Buyers** (G.J.) 5, Belgrave Gardens, London, N.W.8. MAI 7513.

THE WALES GAS BOARD, Conway Undertaking have for disposal OPERATING GEAR and ELECTRIC MOTOR for a 15 cwt. Etchells, Congdon and Muir Lift. The gear comprises an Electric Motor Reduction Gear, Rope Driving Pulley and Electric Control Gear. All are in sound condition and comparatively new. Full particulars may be obtained from H. B. Kendrick, Engineer and Manager, Conway Undertaking, Castle Street, Conway.

SCRAP GAS METERS WANTED!
A SPEEDY SERVICE
TOP PRICES PAID
Collection arranged from anywhere in U.K. Truck Loads to our own private siding.
Boddington Lane, Southern Region.
Sell to those best suited to deal with them
Sell to MITCHAM SMELTERS LTD
ROMETAL WORKS, RED HOUSE ROAD, MITCHAM ROAD, CROYDON, SURREY
TELEPHONE
THOrnton Heath 6101
PRIVATE BRANCH EXCHANGE



A BATTERY OF MULTIFILM WASHERS

for Ammonia, capacity 15 million cu. ft. per day

installed at the Garston Works, Liverpool, for the North Western Gas Board. Other units at Garston include, Vacuum Benzol Recovery and Desulphurising Plant, Naphthalene Washing Plant, three Holmes-Connersville Meters, and three Holmes-Connersville Exhausters.

FOUNDED 1850 HOLMES HUDDERSFIELD

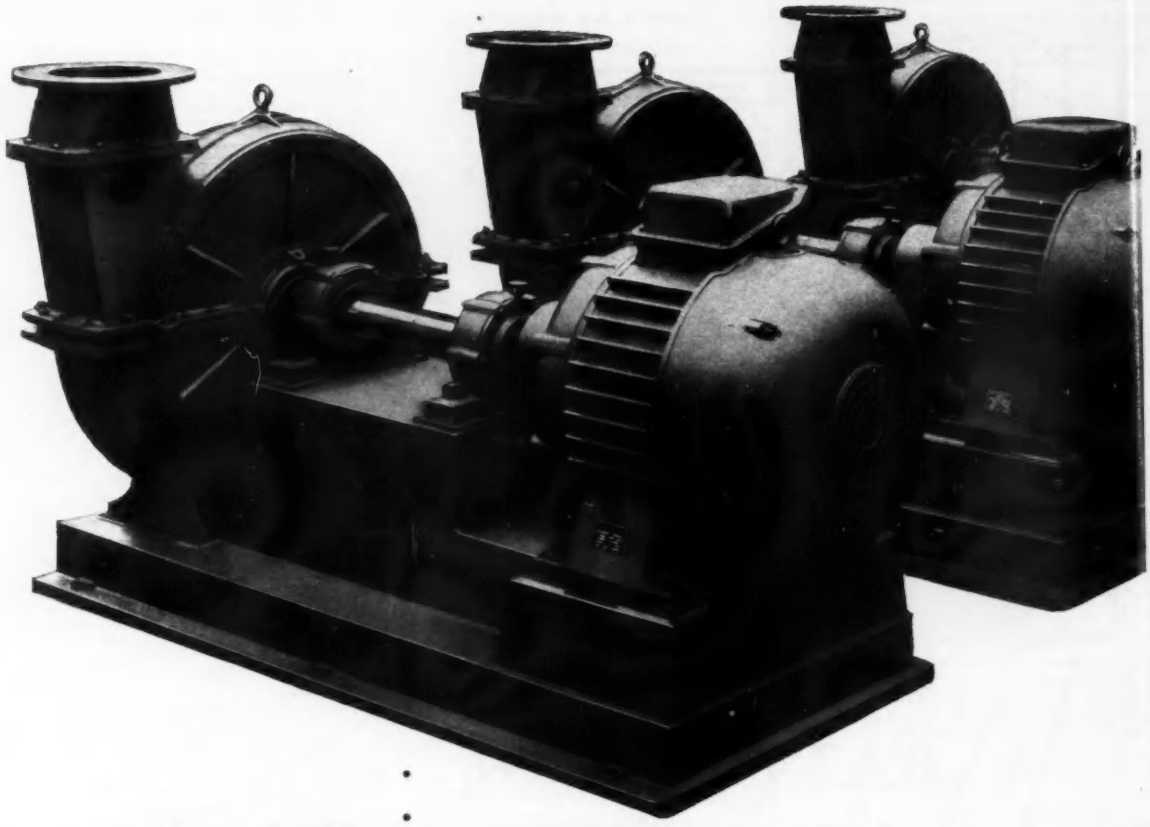
W. C. HOLMES & CO. LTD LONDON · BIRMINGHAM

Telephone : Huddersfield 5280

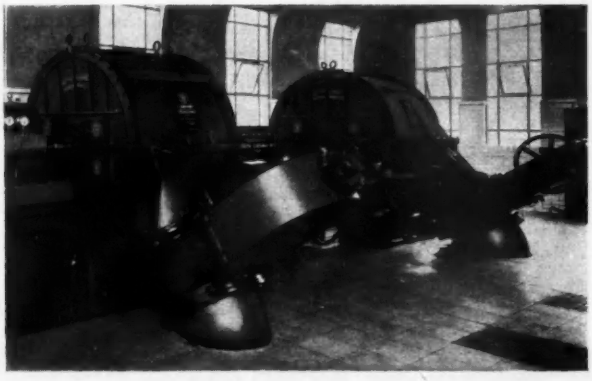
. . . . . London Victoria 9971

. . . . . Birmingham Midland 6830

C407



Gas Boosters?



EXAMPLES of gas boosting fans with cast iron casings are illustrated here. They represent the results of special attention to the design and development of robust, trouble-free boosters over the years. This experience provides fans for handling volumes of 5,000 to 1½ million cubic feet of gas per hour at pressures up to several pounds per square inch.
When the time comes you'll find there's no easier way to solve your air or gas moving problem than to put it to Keith Blackman.

contact **Keith Blackman Ltd**
MILL MEAD ROAD · LONDON · N17 · TOTtenham 4522

T.A.7225/611

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WEST'S

CARBONIZING SYSTEMS

WEST'S GAS IMPROVEMENT CO. LTD

OFFERS:—

GLOVER – WEST

CONTINUOUS VERTICAL RETORTS

C.O.L.

INTERMITTENT VERTICAL CHAMBERS

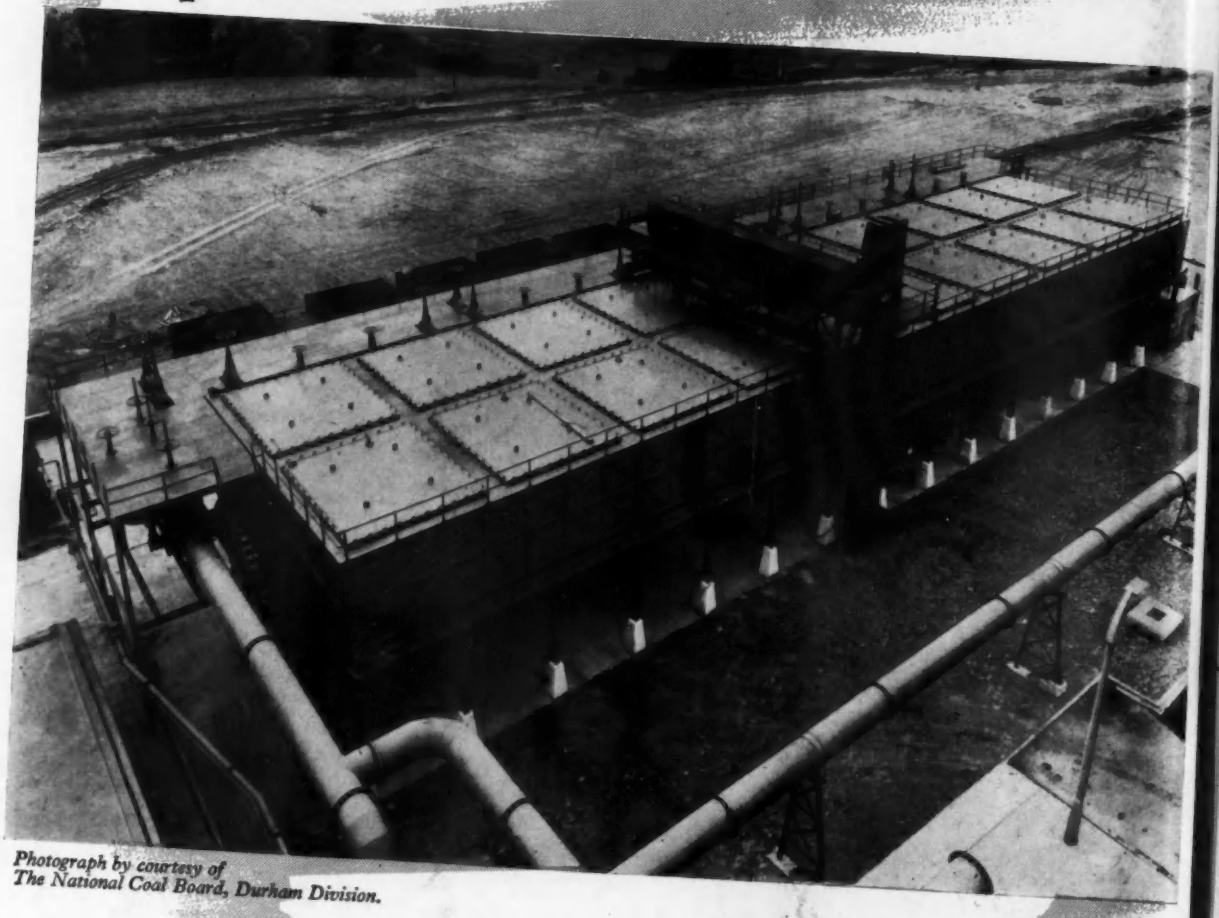
COLLIN

COKE OVENS

WEST'S GAS IMPROVEMENT CO. LTD
ALBION IRONWORKS · MILES PLATTING
MANCHESTER 10
Telephone: COLlyhurst 2961 Telegrams: Stoker, Manchester

AND IN LONDON:—
Columbia House, Aldwych, W.C.2. Tel: HOL 4108 Grams: Wesgasco,Estrand
C.O.L. Div: Chandos House, Buckingham Gate, S.W.1. Tel: ABBEY 6912

7 MILLION CUBIC FEET PER DAY



Photograph by courtesy of The National Coal Board, Durham Division.

Cast Iron Gas Purifiers

These Purifiers, recently completed for the new Fishburn Coking Plant of the National Coal Board, are another example of a completed Purifier installation by Newton Chambers. May we assist you with your Purification problems?

NEWTON CHAMBERS

& CO. LTD., THORNCLIFFE, Nr. SHEFFIELD